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WORKING PLAN

FOR THE

METTUPALAYAM AND BHAVANI RANGES OF COIMBATORE CENTRAL FOREST DIVISION

1963-64 to 1972-73

BY

Sri J. WILSON

Madras Forest Service

Under the direction of the Chief Conservator of Forests, Madras

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GOVERNMENT OF MADRAS

1966

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PREFACE.

This working plan deals with the forests of the Mettupalayam and Bhavani Ranges of the newly constituted Coimbatore Central Forest Division. The working plan prepared by A. M. Mahmood Hussain (1st April, 1954 to 31st March, 1969) for the whole of the then Coimbatore North Forest Division was the last working plan to deal with these forests. The Coimbatore Central Forest Division came into being on 1st July, 1961 in accordance with G.O. Ms. No. 1433, Food and Agriculture, dated 19th April, 1961. The new division was carved out of the Mettupalayam, Bhavani and Perianaickenpalayam Ranges of Coimbatore North Forest Division and the Bolampatty Range of Coimbatore South Forest Division. When the Government order was received, the writer had completed a working plan for the Bolampatti Range, and was midway through the preparation of a working plan for the Perianaickenpalayam Range. In order to have a separate working plan for the whole of the new Coimbatore Central Forest Division, the Chief Conservator of Forests ordered the writer to separate out the prescriptions of Mahmood Hussain for the Mettupalayam and Bhavani Ranges from his integrated plan for Coimbatore North Forest Division without effecting any change. Any deviations from the original prescriptions of Mahmood Hussain were ordered to be incorporated as amendments to the existing plan in force.

The writer commenced reconnoitring the forests of the two ranges from 1st January, 1962, but soon discovered that whereas in the Mettupalayam Range some of the prescriptions of Mahmood Hussain's plan were in force, in the Bhavani Range, none of the prescriptions was in force. The writer, therefore, reported to the Chief Conservator of Forests suggesting that a regular revision of the working plan should be undertaken. Thereupon, the Chief Conservator of Forests ordered that necessary changes to those prescriptions which were not in force may be made after obtaining the Chief Conservator's specific orders on each issue, but without observing the usual formality of submitting a Reconnaissance Report. This which amounted practically to a regular revision of the working plan was undertaken by the writer and completed, and the working plan division was wound up on 5th July 1962.

With the likelihood of the metric system being ushered in a year or two, it was felt that if metric equivalents for all units quoted in the working plan are given in brackets, it would help the territorial staff to acquaint themselves with the change. This has been done.

As per the instructions of the Chief Conservator of Forests, all plant species mentioned in the working plan have been referred to by their local, English or Tamil names only, wherever such names existed. The botanical name of any species has been given in brackets only the first time the species is mentioned in the plan.

Some difficulty was experienced by the writer in the preparation of maps for some of the ex-panchayat forests in the Erode taluk, as the relevant maps for these areas were not available. Only cut and mounted maps were available. These had to be traced out in fragments, then put together and the whole map recast. There is possibility of some error having crept in by this method, but in the absence of any other map, the writer had no other alternative.

A staff of one Ranger, two Foresters and one Lower Division Clerk assisted the writer both in field and office work. The writer places on record his indebtedness and thanks to the various persons who had rendered advice and help in the preparation of this plan.

Coimbatore,
5th July 1962.

J. WILSON,
Working Plans Officer.

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PART I

Summary of facts on which the proposals are based.

CHAPTER I—THE TRACT DEALT WITH.

SECTION 1—NAME AND SITUATION.

1. The working plan deals with the reserved forests of the Mettupalayam and Bhavani Ranges of the Coimbatore Central Forest Division as at present.

2. The range is situated between 11° 12′ 42″ and 11° 31′ 24″ north latitude, and 76° 41° 6″ and 77° 42′ 6″ longitude, east of Greenwich. All these forests are situated in the Avanashi, Gobichettipalayam and Erode taluks of Coimbatore revenue district. Certain other reserves such as the Constantia Reserved Forest, Sandalwood Reserved Forests I and II, Aduthurai, Aduthurai Extension I and II and Kallur (portion) reserved forests which fall in the Coonoor taluk of Nilgiris district are included in the Mettupalayam Range for administrative convenience.

SECTION 2—CONFIGURATION OF THE GROUND.

3. The area dealt with can be classified under two categories: (1) The Nilgiri slopes and (2) the plains forests—each of which may be described separately.

The Nilgiri slopes.—These form the eastern face of the Nilgiris and include the bulk of the forests of Mettupalayam Range. The ground falls sharply in all directions from a maximum altitude of 5,028 feet (1,617.87 metres) to 1,500 feet (457.20 metres) and then very gradually to the Moyar Valley (900 feet or 274.32 metres) in the north and the Bhavani Valley (800 feet or 243.84 metres) in the west. The Odanthorai Reserved Forest covers almost all the available flat area extending up to Mettupalayam Town and the Bhavani river.

4. The northern portion of the hills is drained by the Coonoor river, the Kallarpallam, the Halur Halla and the Tattaipallam all forming a perennial river system draining into the Bhavani. The Patticombai Halla (a feeder of the Moyar) and the Moyar itself drain the north-eastern portion of the hills. The western portion of the hills is drained by the Manar river, the Kilparli stream, the Niralaipallam, the Chengalpallam and the Kallumadaripallam, all tributaries of the Bhavani.

5. *The plains forests.*—These include isolated hillocks such as the Nellimalai Reserved Forest near Mettupalayam and Chennimalai, Vellikkaradu, Arachalur, Voipadi and Kongampalayam reserves in Erode taluk, and more or less level tracts such as the Modur-Pethikuttai and Odanthorai Reserved Forests near Mettupalayam and the Velamundy Reserved Forest, south of Bhavanisagar.

6. *The Bhavanisagar Dam.*—The Lower Bhavani Project was completed in 1952 damming the Bhavani below the confluence of the Moyar with it. The reservoir submerges portions of four reserves, viz. :—

(1) The Nilgiri Eastern Slopes Reserved Forest.

(2) The Velamundy Reserved Forest.

(3) The Modur-Pethikuttai Reserved Forest.

(4) The Odanthorai Reserved Forest.

7. After much consideration it was decided that the submergible area should continue to be reserved forest.

8. *The Kundah Project.*—The third and fourth stages of the Kundah Hydro-electric Project which are now under execution fall within the Mettupalayam Range. When completed, these are likely to change the topography of the land to a certain extent as it is proposed to dam the Bhavani near Pillur apart from large areas having to be disafforested.

SECTION 3—GEOLOGY, ROCK AND SOIL.

The district has not been geologically surveyed.

9. *Rock.*—The underlying rocks belong to the great gneissic series, the chief components of which are quartz, horn-blende, felspar and garnite. Mica as such is rare. Foliation is seldom well developed, the rock being to all appearance a perfect granite.

The strike is generally north-west.

10. *Soil.*—The soil shows much variation. Along the hills the soil varies from patches of black clayey soil in portions of the Nilgiri Eastern Slopes Reserved Forest to a shallow reddish loam in other areas. In the plains forests the soil is shallow, thin and stony.

SECTION 4—CLIMATE AND RAINFALL.

11. *Climate.*—The plains and the lower slopes of the Nilgiri Hills are subject to a very hot and dry climate. Strong winds and dust storms are common in the hot months. During the months of November, December and January, the weather becomes pleasant but never cold. The upper slopes exemplified by the hill camp of Kunjapanai are particularly delightful throughout the year on account of the higher elevation and the consequent lower temperature.

12. *Rainfall.*—There is no marked variation in the amount of precipitation received in the various parts of the tract. The average rainfall is about 75 centimetres on the plains and along the foot hills, increasing to about 120 centimetres to the crest of the hills which carry a poor type of shola. In the Mettupalayam Range both the monsoons are felt, but much of the precipitation is from the north-east monsoon. The rainfall is adequate for the free growth of sandal in the region, but is too meagre to support a high forest of good quality. The panchayat forests in Erode taluk which are far away from the hills receive rain mainly from the north-east monsoon, precipitation from the south-west monsoon being practically negligible.

13. A tabular statement showing the average annual rainfall in centimetres at the various recording stations within the region is given in Appendix I. The only rain gauge station within the reserved forests is at Niralai, but as it is not being maintained, no recordings have been made during the past many years. This station is also likely to be submerged in the proposed Pillur reservoir. There are no other rain gauges in the region maintained by the department.

14. *Winds.*—In May, thunderstorms with occasional bursts of rain are common all over the tract.

15. During the south-west monsoon period from June to September, the tract is subjected to strong gales blowing from a westerly direction, which when they do not bring rain have a desiccating effect.

16. *Health.*—The Nilgiri slopes were said to be highly malarial at one time. Large scale anti-malarial operations like annual spraying of synthetic insecticides, clearing of the jungle around habitations and the advent of powerful anti-malarial drugs have brought down the incidence of the disease to a negligible quantity.

SECTION 5—WATER-SUPPLY.

17. The Bhavani, the Kallar, the Coonoor river, the Moyar and the Kotagiri Halla are all perennial rivers, in whose vicinity water supply is good and ample.

18. The plains of Mettupalayam Range are well served with a number of perennial streams rising in the Nilgiris. A network of channels carrying water for agricultural purposes has been constructed by private enterprise. In addition to these minor irrigation channels, the Bhavanisagar Dam which has been constructed by the Public Works Department below the confluence of the Bhavani with the Moyar serves to irrigate an extensive area in the Gobichettipalayam, Erode and Dharapuram taluks.

19. There is no well attached to the Kunjapanai Rest House in the Mettupalayam Range. There is a however a District Board tank and well about three-fourths of a mile away from the rest house but it fails during summer. It is a pity that there is no perennial spring anywhere near the rest house either, that camping in this delightful resort is rarely resorted to.

SECTION 6—DISTRIBUTION AND AREA.

20. The total extent of the forests of the region is 130.25 square miles (337.34 square kilometres). The region consists of two ranges as shown below :—

Serial number and name of range.	*Headquarters.*	*Area in acres*	*(hectares.)*	*Number of beats.*
(1)	(2)	(3)	(4)	(5)
1 Mettupalayam ..	Mettupalayam ..	70,019·16	(40,476·70)	9
2 Bhavani	Erode	13,338·16	(5,397·77)	5
		83,357·32		

21. A complete list of all the reserves in the range, their extent and legal position is given in Appendix II.

SECTION 7—STATE OF BOUNDARIES.

The boundaries are partly natural and partly artificial.

22. *Natural boundaries.*—The Manar forms a natural boundary on the west to a certain distance delimiting the Melur Slopes Reserved Forest of the Mettupalayam Range with that of the Kerala State. The Bhavani forms the southern boundary of the Mettupalayam Range for a good distance. The Patticombai Halla and the Moyar form a natural boundary for the forests of Mettupalayam Range along the north delimiting them from the Nilgiris and Coimbatore North Forest Divisions respectively.

23. *Artificial boundaries.*—Where natural demarcations do not exist, the outer boundaries of the reserves are defined by cleared boundary lines, 12 to 18 feet (3.60 to 5.49 metres) wide with cairns and numbered stone pillars. Small stones have been kept in lines between the cairns in many of the reserves.

24. Owing to the great length of boundary lines and the inadequacy of staff, boundaries are not regularly and properly cleared. The stone cairns have been knocked down by elephants in places frequented by them and the numbers along the stone pillars have been obliterated due to efflux of time.

25. There is no demarcation on the ground between two different reserves lying contiguous to one another. As the demarcation is only of academic interest, it is not necessary to waste large sums in clearing such lines annually.

SECTION 8—LEGAL POSITION.

26. All the forests dealt with herein have been notified as reserved forests under section 16 of the Madras Forest Act of 1885 and are the absolute property of the state subject to certain specified rights and concessions. The details of notification are given in Appendix II.

27. *Unreserves and patta lands.*—Though the unreserves and *patta* lands in villages enclosed in or adjoining reserved forests are not under the administrative charge of the District Forest Officer, yet the extraction of sandal trees from such lands is carried out by the Forest Department.

28. *Unreserve sandal*—Sandal trees occurring in unreserves are the property of the state. The Revenue Divisional Officer is entrusted with the protection of the unreserves and discharges for these lands the functions of a District Forest Officer under the Madras Forest Act. The unsatisfactory nature of the protection afforded to the sandal stock and the wide prevalence of *sivoijama* cultivation have been referred to in sufficient detail in Ranganathan's working plan. The extent of unoccupied land has

dwindled considerably during the last twenty years. Especially during the past ten or twelve years, quite a large number of plains men displaced from the villages submerged in the Bhavanisagar Project have migrated to the hills and have become *sivoijama* cultivators. The conservation of sandal has been consequently hit rather adversely.

29. *Patta sandal.*—The history of the changes of policy in regard to the title of the Government to sandal trees growing on *patta* lands has been described in detail in Ranganathan's working plan. The present position may be briefly summarized as follows

30. *Patta* lands fall into two categories in the Mettupalayam Range :—

(i) Lands assigned on patta prior to issue of G.O. No. 1290, Revenue, dated 10th June, 1928. On such lands, Government have no clear title to the sandal trees.

(ii) Lands assigned after the issue of G.O. No. 1290, Revenue, dated 16th June 1928. On such lands all existing and possible future growth of sandal trees are the property of the Government. This is a close approximation by executive action to declaring sandal a 'royal tree '.

Section 9—Rights and Concessions.

31. *Rights.*—All the reserved forests are the absolute property of the Government and none is encumbered with any rights of importance. A list of all rights admitted are given in detail in Appendix III of the plan.

32. *Concessions.*—At the time of forest settlement, lands were set apart to the hill tribes residing within the reserved forests under a system of annual leases. A few fresh settlements have also been opened during recent years. The terms of these leases are detailed in Chapter IV. The following is a list of all the existing settlements :—

1. Melapillur.
2. Kilpillur.
3. Unjalanaicombai.
4. Morikodu.
5. Ulliyur.
6. Aniyur.
7. Sitheguni.
8. Veerakkal.
9. Korapathi.
10. Manar.
11. Sundapatti.
12. Kilsengal.
13. Geddaikadu.
14. Uppupallam.

33. Of these, the last nine settlements have been abandoned by the original Irular settlers who have migrated elsewhere, but there is a proposal to re-open them.

CHAPTER II—THE FOREST.

Section 1—Composition and Condition of the Crop.

34. The forests of the region may be considered to fall under the following main types :—

I. Southern Cutch thorn forests—Champion's type 5a/C1.

II. South Indian dry mixed deciduous forests (without teak)—Champion's type 4a/C2.

III. Dry Savannah forests—Champion's type D. Tr/2S/3.

IV. Nilgiri sub-tropical evergreen forests—Champion's type 7a/C1.

35. A description of the various types is briefly given below.

36. *5a/C1 Southern Cutch thorn forests.*—This type occurs all over the scattered plain forests of the region as also along the foot hills of the hill slopes of Mettupalayam Range below an elevation of 2,000 feet (609.60 metres). At elevations above 2,000 feet

(609.60 metres) along the Mettupalayam hill slopes where the rainfall is above 65 centimetres per annum, it is replaced by the dry deciduous type of forest. The climatic conditions in this type of forest are very dry, the annual rainfall being below 65 centimetres per year. The soil is generally thin, shallow and stony. Outcrops of gneiss, limestone and granite are rather common in the plains forests. Grazing is intense in this type of forest. There is only a thin grass growth which may appear fairly complete during the short rainy season but the soil is more or less bare during the other seasons. Due to the constant tread of cattle, the surface is hard and caked creating inimical conditions for regeneration.

37. The overwood consists of an almost xerophytic open scrub of low density with trees usually having short boles and low branching crowns. The chief species found are *Unjal* or *usil* (*Albizzia amara*), *Porasu* (*Chloroxylon swietenia*), *Anaimulal* (*Acacia latronum*), *Palai* (*Wrightia tinctoria*), *Velvelam* (*Acacia leucophloea*), *Mulkiluvai* (*Commiphora berryi*), *Vandalai* (*Givotia rottleriformis*), *Athi* (*Bauhinia recemosa*), *Parambai* (*Acacia ferruginea*), *Malankiluvai* (*Protium caudatum*), *Neem* (*Azadirachta indica*), *Tamarind* (*Tamarindus indica*), *Thoratti* (*Scutia mytina*), *Pyrai* (*Canthium dicoccum*), *Kalli* (*Euphorbia antiquorum*), *Vakkanai* (*Diosypros montana*) and species of *Zizyphus*. Along the foot-hills of Mettupalayam Range where this type of forest occurs there is generally a fair stocking of the species mentioned and the height of the overwood averages about 20 feet (6.10 metres) over most of the area. In the ex-panchayat forests along the plains where the locality factors are most hostile like a shallow stony soil with outcrops of quartzitic boulders, a height of 20 feet (6.10 metres) is the exception rather than the rule and more often the forest dwindles into one of *Kalli*, *Anaimullu*, *Athondai* (*Capparis zeylanica*) and scrub.

38. Generally in the Cutch thorn type of forest there is a preponderence of useless species over the more useful ones. For instance, in the foot-hills along the Manar and Bhavani valleys, species such as *Malankiluvai*, *Kalli*, *Thanaku*, *Vandalai* and *Mulkiluvai* form nearly 40 per cent of the crop even in areas not felled in the past, the proportion being considerably higher in the worked coupes. The same is the case with the isolated hillocks in the Erode taluk such as the Sennimalai, Arachalur and Vellikaradu reserves where the proportion of useless species is even up to 90 per cent, the better ones apparently having been removed during the panchayat regime. In the Voipadi and Kongampalayam reserves the only useful species present are a few scattered trees of Neem and *Palai*, 90 per cent of the overwood consisting of *Mulkiluvai*. In the Velamundy Reserved Forest, *Anaimullu* is the preponderant species forming nearly 70 per cent of the crop.

39. Sandal (*Santalum album*) occurs in this type of forest, but its distribution is limited to the Mettupalayam Range. The species occurs in fair quantities, but most of the trees are below 15 inches (38.10 centimetres) in girth. It is generally believed that the sandal in these areas originally spread from the Nilgiri Hill slopes and the plateau regions of Coimbatore North Forest Division. The incidence of spike is markedly less, this probably being attributable to the generally low incidence of the species. In the Velamundy and Modur Reserves a stray sandal may be met with but it is otherwise absent elsewhere.

40. An understorey in this type of forest is not distinguishable as in the ex-panchayat forests along the plains. In the better protected forests along the foot-hills of Mettupalayam Range a rather ill-defined understorey with sapling and pole stages of the overwood, and shrubby species such as *Karai* (*Randia dumetorum*), *Sembulichan* (*Erythroxylon monogynum*), *Elandai* (*Zizyphus mauratiana*), *Vedathalam* (*Dichrostachys cinerea*) and *Veppula* (*Securinega leucopyrus*) may be seen.

41. The undergrowth is scanty and consists of *Avaram* (*Cassia auriculata*), *Pullavaram* (*Mundulea sericea*), *Virali* (*Dodonaea viscosa*) and *Athondai* but quite often species such as *Puchedi* (*Lantana camara*), *Indu* (*Acacia intsia*) *and Karu Indu* (*Pterolobium indicum*) form dense thickets in worked coupes and around Irular settlements.

42. *Natural regeneration.*—Natural regeneration of valuable species is generally inadequate in this class of forest. The position is even worse in the worked coupes and in the ex-panchayat forests. Artificial regeneration wherever possible is therefore very necessary to improve the stocking.

43. *Artificial regeneration.*—In an effort to restock the ex-panchayat forests with useful species soon after their reversion to the Forest department in 1951, valiant efforts were made at regeneration. Large areas were tried year after year with cashew and a host of miscellaneous fuel species, but the efforts have all proved futile. Attempts at restocking the worked coupes in the fuel series have also been made on a small scale. These too have not met with any sustained success. The details of the regeneration work done are all given in Chapter V.

44. 4a/C2 *South Indian dry mixed deciduous forests (without teak).*—This type of forest occurs along the hill slopes of Mettupalayam Range above an elevation of 2,500 feet (162 metres) up to the 4,000 feet (1,219.20 metres) contour where it is replaced by the sub-tropical evergreen forest. The annual rainfall in this type of forest is generally between 85 to 110 centimetres, the slightly higher rainfall over the Cutch thorn type of forest being the result of the higher elevation. The soil is shallow and stony and outcrops of sheet rock are rather common. The chief species are Sandal, *Velvayai* (*Albizzia Lebbek*), *Vagai* (*Albizzia procera*), *Vengai* (*Pterocarpus marsupium*), *Pachalai* (*Dalbergia paniculata*), *Thovarai* (*Diospyros species*), *Vilamaram* (*Feronia limonia*), *Thadasu* (*Grewia species*), *Thani* (*Terminalia belerica*), *Mulvengai* (*Bridelia retusa*), *Vellanagai* (*Anogeissus latifolia*), *Palai*, Neem, Tamarind, *Pyrai*, *Thanaku* and *Vandalai*. Tamarind is a fairly common tree everywhere in this type, but near Ulliyur it is often almost gregarious, large numbers of trees being found over compact areas. The height of the overwood varies from 30 to 45 feet (9.14 to 13.72 metres) and may even go up to 60 feet (18.29 metres) along the stream margins where the soil is deeper and physiologically moister. Teak is seldom found in this type of forest. Bamboos are plentiful and both the species *Kalmungil* (*Dendrocalamus strictus*) and *Perumungil* (*Bambusa arundinacea*) are seen to occur. *Kalmungil* is the more predominant bamboo, but *Perumungil* is confined to stream margins and other moist localities, except in the Kallar and Hulikal reserves where it is found more extensively.

45. The dry deciduous type of forest is by far the most valuable class of forest in the region owing to its content of sandal. The species is found to grow freely on almost every type of soil, on stony red soil along the higher reaches of the Moyar Valley, on alluvial soil along the Halur Halla, on rich loam in the Hulikal, Kallar and Jaccanare Reserves and on shallow gravelly soil in portions of the Melur and Pillur slopes.

46. Sandal also shows a similar tolerance towards differences in rainfall. Not only is the species found extensively in the comparatively drier Cutch thorn forest, but also extends into the sub-tropical evergreen forest in the Sandalwood Reserved Forests I and II and portions of the Constantia, Kallar and Hulikaldrug reserves where the annual rainfall may extend up to 160 centimetres.

47. The main factors which operate as effective checks to the free spread of sandal are grazing and repeated fires. To a certain extent, the heavy incidence of grazing in sandal areas minimises the fire hazard, and of the two evils, grazing seems to be the lesser, as it gives a chance of survival to seedlings protected by thorny bushes. The retreat of the sandal forest as a result of the ravages of fire is a matter for serious concern. In the Moyar Valley for example, many areas that contained sandal according to the 1932 stock maps have no sandal at all now, and fires have taken a heavy toll. The fact that sandal does not spread to steep slopes and is confined to flat or undulating country indicates that fire is the governing factor in the distribution of the species. But once sandal gets a chance to spread in a locality naturally protected from fire and excessive grazing, the species spreads rapidly. It is therefore clear that the savannah type of forest met within the region with *Vellanagai*, coarse grasses and other associate species is only the result of retrogression in an originally dry deciduous type of forest which contained sandal.

48. The factors of the locality such as soil, rainfall, etc., appear to be only of secondary importance in the occurrence and distribution of sandal, except in so far as they determine the nature and health of the host trees and the types of forest formation. In moist fertile localities or in regions of heavy rainfall or in the sholas, where the crop is of the high forest type, sandal is either absent or if it is introduced artificially, shows little tendency to spread and contains little or no heartwood.

49. The nature of the general crop appears to be an important factor in the distribution of sandal. It is a tree of deciduous associate formations especially of the bush type, and it may be that it is a transitory species tending to vanish with the progressive

improvement of a crop in density and height growth. It is among the earliest species to arise in abandoned clearings after bush formation has taken place. The bushes which are usually thorny, protect the young sandal from exposure, cattle and wild animals.

50. One of the probable causes for the occurrence of sandal in the neighbourhood of villages is the fact that birds are more numerous around cultivation than in the interior of the forest. Birds are undoubtedly the most important agents in the dispersal of sandal. They eat the fruits and pass the stones out and it is possible that the germinating power of the seeds is increased by this process.

51. The lower storey is not well defined and consists of sapling and pole stages of the overwood and shrubby species such as *Kattu elimichai* (*Atalantia monophylla*), *Kuttipila* (*Streblus asper*), *Kilakkai* (*Carissa carandas*), *Vellakumil* (*Gmelina asiatica*), *Pavattai* (*Pavetta indica*), *Veppula*, *Sembulichan*, etc. *Puchedi*, *Indu* and *Karu Indu* often form dense masses of thickets around Irular settlements and enclosures and suppress regeneration badly.

52. Undergrowth is generally scanty, the few species being present are *Kurinji* (*Strobilanthes* species), *Sundakkai* (*Solanum trilobatum*), *Poolai* (*Aerva lanata*), etc. *Yanaikellikodi* (*Derris* species), *Odankodi* (*Hippocrates indica*) and *Ootkal kodi* (*Ichnocarpus frutescens*) are the chief climbers.

53. *Natural regeneration.*—Natural regeneration of fuel and small timber species is generally inadequate in this type of forest.

54. Sporadic flowering of *Kalmungil* is now taking place in the Mettupalayam Range, The general flowering of bamboos in other parts of the Coimbatore Central Forest Division has not affected the bamboos in Mettupalayam Range so far. The last general flowering of *Kalmungil* in the Mettupalayam Range took place between 1915–17.

55. Regeneration of sandal is quite adequate as the species seeds freely. Sandal trees standing in the open or on *patta* lands generally bear a heavier seed crop than do trees in the reserves. This is probably due to the freer crown development of *patta* sandal trees and to the increased photosynthetic activity of foliage fully exposed to the sun. The seeds ripen in the earlier case.

56. It is believed that the germination of sandal seeds takes place most freely in freshly turned loam. The presence of humus or other manure appears to act adversely on germinating seeds. As an example of this, the most prolific regeneration is often seen under mother trees in ploughed lands, while on humus soils and semi-sholas the percentage of germination is very low.

57. In the forest, sandal seedlings are observed almost exclusively in the shelter of thorny bushes. Seedlings do not come up in the open, or, if they do, they are browsed down by cattle.

58. *Artificial regeneration.*—Except for a few isolated attempts at artificial regeneration with sandal and some of the indigenous fuel species, no evidence of any large-scale artificial planting is found.

59. *D. Tr./2S/3—Dry Savannah forests.*—This type occurs as a fire sub-climax along the upper reaches of the Nilgiri Eastern slopes reserved forest. The soil and rainfall factors in this type of forest are the same as in the dry deciduous type. These forests originally belonged to the dry deciduous type of forest mentioned in paragraph 44 but repeated burning has retrogressed these forests to a dry savannah type. The canopy is open and consists of fire hardy species such as *Vellanagai*, *Vengai*, *Kadukkai* (*Terminalia chebula*), *Acha* (*Hardwickia binata*), *Saraiparuppu* (*Buchanania lanzan*), *Thovarai* (*Diospyros melanoxylon*), *Konnai* (*Cassia fistula*), *Thanaku* (*Cochlospermum religiosum*) and *Eacham* (*Phoenix sylvestris*) amidst an undergrowth of coarse grasses such as *Cymbopogon* species and *Oosipullu* (*Heteropogan contortus*). The stems are mis-shapen and stunted.

60. These areas originally contained sandal no doubt, but with repeated fires the species is completely killed out and *Vellanagai* springs up often gregariously unless the fires are too intense to allow any tree growth to survive. These fires are generally caused by graziers in search of tender grass for their cattle or by minor forest produce collectors

in search of honey or gall-nuts. The percentage of grasses increases year after year resulting in a sort of vicious cycle, as the grasses are very inflammable. Ultimately the forest turns out to be a sea of lemon grass with a few scattered trees of *Eacham*.

61. 2A/C2 *West coast tropical semi-evergreen forest.*—This type occurs as a transition zone at elevations above 3,500 feet (1,371.60 metres) in the Mettupalayam Range between the dry deciduous type of forest, and the sub-tropical evergreen forest, or as an edaphic sub-climax along the stream beds in areas of lower elevation which bear a deciduous crop.

62. The annual rainfall received along the hill slopes where this type of forest occurs varies from 150 to 175 centimetres. The higher elevation contributes to the better rainfall than in the deciduous type of forest both in quantity as well as in distribution. The soil is generally an argillaceous loam aided by a plentiful supply of humus. From the climatic factors it is evident that the crop left to itself will in course of time change to evergreen conditions, but this possibility is averted by constant fires from the surrounding deciduous forests which often eat into the semi-evergreen forest thereby setting a retrogression to the deciduous type.

63. The principal species met with are *Naval* (*Syzygium cumini*), *Mango* (*Mangifera indica*) *Milachadayan* (*Bischofia javanica*), *Malankonnai* (*Acrocarpus fraxinifolius*), *Vedivembu* (*Chuckrassia tabularis*), *Pupadiri* (*Stereospermum personatum*), *Kannirmaram* (*Elaeodendron glaucum*), *Mayiladi* (*Vitex altissima*) *and Athadali* (*Filicium decipiens*), although an admixture of deciduous species, such as *Karuvagai*(*Albizzia odoratissima*), Rosewood (*Dalbergia latifolia*), Sandal and *Vengai* are often present. Sandal occurs sparsely but shows no signs of spreading. *Perumungil* is the only bamboo found in this type of forest and it occurs rather plentifully in the Kallar, Hulikal and Aduthorai reserves.

64. Along stream banks in the dry deciduous forest where the semi-evergreen type occurs, the principal species met with are *Nirmathi* (*Terminalia arjuna*), *Aya* (*Holoptelea integrifolia*), Mango, *Naval*, *Milachadayan*, etc.

65. The undergrowth is for the most part of rank growth of *Kurinji* (*Strobilanthes* species), *Kulapanai* (*Glycosmis pentaphylla*), *Valambiri* (*Helicteres isora*), *Vattakanni* (*Clerodendron viscosum*) and others. Climbers are numerous, the principal ones being *Kattumilagu* (*Toddalia asiatica*), *Cillu* (*Entada phaseoloides*) and *Vennalankodi* (*Hiptage benghalensis*). Bracken and maiden hair ferns come up gregariously during the monsoon carpeting the forest floor.

66. 7a/C1. *The Nilgiri sub-tropical evergreen forest.*—On elevations above 4,000 feet (1,219 metres) along the Nilgiri slopes, a few patches of "stunted rain forest" occur surrounded by grassy patches which are annually subjected to fires. A few patches of this type of forest occur in the Aduthorai Extension Reserved Forest (Lady Canning Seat Reserved Forest), in the sholas above Kadambakombai in Pillur Slopes Reserved Forest, and Singamalai and Kullankeraimalai in Nilgiri Eastern Slopes Reserved Forest. The forest here is similar to the rain forest but not so luxuriant, the trees being smaller and with unshapely boles, and often studded with lichens, mosses and herbaceous epiphytes although species such as *Kolamavu* (*Machilus macarantha*), *Nangu* (*Mesua ferra*), *Milachadayan*, *Kattupinnai* (*Calophyllum elatum*), *Pali* (*Palaquium*) *ellipticum*, *Naval* (*Syzygium species*), *Rudraksham* (*Elaeocarpus serratus*), *Cinnamomum sulphuratum and* others. Dense undergrowth of chiefly *Kurinji* (species of *Strobilanthes*) occurs in this type of forest. At elevations above 5,000 feet (1,524 metres), *Poomaram* (*Rhododendron arboreum*), *Kamblivetti* (*Symplocos laurina*), *Ilex denticulata*, *Kolakkai* (*Gaultheria fragrantissima*) and other species common to the Nilgiri Southern wet temperate forests make their appearance.

Section 2—Injuries to which the crop is liable.

67. The various causes of injuries to the forest are considered below.

68. *Winds.*—The region is comparatively windless and except for occasional windfalls of sandal which is a surface rooter, hardly any damage is done by winds.

69. *Fires.*—The Bhavani Range is generally free from fires. In the Mettupalayam Range it may be said that almost all the steeper slopes are burnt regularly once in two years. Fires have been common in these parts for many decades (and possibly centuries)

so that the crop on the ground is by no means a true expression of the factors of the locality. but is the resultant of the locality and the retrogression caused by regular fires and heavy grazing. This is a fact of which the ordinary villager is not aware of. Practically all the fires are caused by graziers or collectors of minor forest produce.

70. Forest fires occur in a vicious circle; a fire generally destroys all natural regeneration but is rarely strong enough to kill the roots of the grass, so that the grass springs up the more readily after a fire and within two years furnishes sufficient inflammable material for another fire. And so the process goes on.

71 While fires are harmful to all growth, they are particularly ruinous to sandal trees and sandal regeneration. The gradual disappearance of sandal from many forests is due to fire and fire alone.

72. The following table abstracted from the fire reports of Mettupalayam and Bhavani Ranges shows the monthly incidence of fires during the period 1956–57 to 1960–61.

Year.	(a) Bhavani Range.			(b) Mettupalayam Range.		
	Number of fires during the year.	Total area burnt in		Number of fires during the year.	Total area burnt in	
		Acres.	Hectares.		Acres.	Hectares.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1956–57 — ..	..	..	—	20	314·00	127.08
1957–58 — ..	2	15·50	6·27	16	226·00	91.46
1958–59	1	55·00	22·25	47	993·00	401.85
1959–60	..	—	..	13	289·00	116.95
1960–61	—	..	..	23	95·00	38.44

73. Figures prior to 1956 are not quoted as they are already covered by Mahmood Hussain's working plan. For the Bhavani Range figures from 1957 onwards alone are quoted as the reconstituted range was formed in 1957.

74. *Injurious plants.—Puchedi* is a serious pest in all worked coupes of the fuel series and in the neighbourhood of Irular settlements. The dense growth of this obnoxious species often inhibits natural regeneration of valuable species, particularly sandal.

75. *Indu, Karu Indu, Churimullu, Yanai kellikodi, Oothalkodi* and *Odankodi* are the common climbers. They are a menace to both coppice and seedling regeneration in the fuel series as well as in other areas. Sandal appears to be one of the worst climber infested species; the climbers seem to show a specific preference for sandal. It is not uncommon to find the crowns of sandal trees completely enveloped by climbers, while other trees are comparatively unaffected. The damage done by climbers is obvious. The trees are partly or completely shut out from light and the dead weight of the climbers is often enough to break the crown of the tree in a gale.

76. *Insects.*—A number of insects have been reported as attacking sandal. N. C. Chatterji, who has studied the insect fauna of sandal in detail has listed out the following pests. The following statement is abstracted from a report made by him to the spike conference of 1930.

'*Flower feeders*'.—One species of *Microlepidoptera* has been seen on sandal flowers.

Defoliators.—One species of *Lasiocampidae* : two species of *Lymantridae* : four species of *Psychidae* : two species of *Geometridae* : one species of *Limoeodidae;* one species of *Locustidae* have been found to feed on leaves of sandal.

Leaf miners.—One species of *Microlepidoptera.*

Twig borers.—One species of *Pyralidae* and one species of *Curculionidae* have been discovered.

Shoot borers.—One species of *Lamiidae* and one of *Hepialidae* have been recorded. One or both are also borers of sandal saplings.

77. Besides the above, dead twigs have been found to be infested with *Scolytidae* and the wood of dead saplings by various species of *Bostrichidae, Buprestidae* and *Cerambycidae.*

78. In addition to the numbers listed out by N. C. Chatterji, the sap sucking *Jassids* considered to be the possible vector in transmitting the spike disease can be also included as an insect pest.

79. *Animals*.—Wild elephants knock down cairns and pull up coupe stones all along the reserve boundaries. They work havoc at times in the Odanthurai plantations stripping down the bark of young poles or breaking them at the top. Sambhur nibble the young shoots of several species in the moister patches. They are said to be very partial to sandal leaves. They also rub off the bark from young sandal trees.

80. Rodents destroy enormous quantities of seeds of various species year after year considerably effecting their regeneration.

81. *Grazing*.—The average grazing incidence for the past five years works out to 6.60 acres (2.67 hectares) per cow unit for the Mettupalayam Range and 1.25 acres (0.50 hectares) per cow unit for the Bhavani Range. The figures for Mettupalayam Range represent only a general average for the whole range, as in practice the accessible foot-hills are generally overgrazed due to their proximity to the villages on the plains.

82. Grazing has its advantageous as well as disadvantages. The damage done by cattle is two-fold :—

(i) It causes mechanical hardening of the soil surface rendering it very hard and unsuitable as a seed bed.

(ii) Cattle browse tender seedlings and kill others by trampling.

83. On the other hand, grazing effectively keeps down the grass and materially reduces the risk of fire.

84. *Goats*.—There can however be no two opinions about the omnivorous goat, commonly reared all along the foot-hills to the great detriment of the forests.

85. *Theft*.—In the plains forests and along the foot-hills of Mettupalayam Range, firewood is often stolen from the forest, but this usually consists in petty pilfering of fuel in head-loads. Removal of small timber for agricultural implements is also rife along the foot-hills. Theft of sandal wood is however rare in the Mettupalayam Range.

86. The state of protection of the sandal bearing unreserves is generally poor and will have to be strengthened. The following statement shows the number of cases reported under the main heads during the period 1956–57 to 1960–61 :—

(a) Mettupalayam Range.

Year.	*Illicit felling.*	*Illicit collection of minor forest produce.*	*Illicit grazing.*	*Incendiarism.*	*Illicit hunting*	*Violation of timber transit rules.*	*Miscellaneous.*	*Total.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1956–57	522	—	22	—	—	28	21	593
1957–58	469	..	33	—	1	44	19	566
1958–59	533	—	16	—	..	46	22	617
1959–60	581	—	21	1	—	46	15	664
1960–61	309	..	13	..	..	16	14	351

(b) Bhavani Range.

Year.	*Illicit felling.*	*Illicit collection of minor forest produce.*	*Illicit grazing.*	*Incendiarism.*	*Illicit hunting*	*Violation of timber transit rules.*	*Miscellaneous.*	*Total.*
1957–58	273	..	13	—	1	..	1	288
1958–59	237	..	13	..	..	1	1	252
1959–60	228	..	32	..	1	..	2	263
1960–61	246	..	60	1	2	1	9	319

Note.—The present Bhavani Range was constituted in 1957.

87. The average revenue derived from compounding fees during the past five years is detailed below :—

Year. (1)	Mettupalayam Range. Compounding fees collected. (2)	Bhavani Range. Compounding fees collected. (3)
	RS. P.	RS. P.
1956-57	4,008 50	..
1957-58	4,734 31	299 50
1958-59	8,565 50	463 00
1959-60	5,639 50	593 00
1960-61	1,282 00	756 50
Total	24,229 81	2,112 00
Average	4,845 96	528 04

NOTE—As the present Bhavani Range was reconstituted only in 1967, figures earlier to this date are not available.

88. *Bark stripping on sandal trees.*—A very common form of damage done to sandal trees is the stripping of patches of sandal bark by men. The bark has a sharp astringent taste and is chewed by the people, presumably with betel leaves. Young saplings are found to be killed by this damage.

89. *The spike disease of sandal.*—By far the greatest source of harm, the disease yet remains unconquered and we are in much the same position as in the thirties. Several tentative conclusions were reached in the course of the investigations conducted in Madras and Mysore but still a great deal of research has to be done to obtain anything conclusive.

90. The disease is widely prevalent wherever sandal occurs in the forests of Mettupalayam Range and in the surrounding unreserves and patta lands.

SECTION 3—FAUNA.

91. The plains forests which contain only a scrubby vegetation do not contain wild life of any importance except for hares, the wild dog, the mongoose, snakes, ground lizards and some of the common birds. Hares are particularly plentiful in the Velamundy Reserved Forest and one hardly misses them skirting across the road while passing through this forest. The red faced bonnet money is restricted to the Sennimalai Reserved Forest where it feeds freely on fruits and other eatables brought by the pilgrims for the local deity and for themselves much to their own consternation.

92. In the comparatively better wooded regions of Mettupalayam Range, the common South Indian Fauna are fairly represented. Much of the wild life in the forests west of the town of Mettupalayam have been driven away further north-east owing to the activities in the Kundah Project areas. Elephants are plentiful in this north-eastern region and large herds are encountered within the Odanthorai, Jaccanare and Nilgiri Eastern Slopes Reserves. They are particularly clustered along the stream banks during the dry season and very often one stumbles across large herds in the course of an inspection. Spotted deer, the black-naped hare, the jackal, the mouse-deer, the wild dog and the wild hog are fairly common everywhere. Sambhur are generally restricted to the few patches of semi-evergreen jungle in the moister pockets along the slopes. Carnivores such as the tiger and the panther are also said to be present, but they are comparatively rare.

93. Birds of many varieties are to be seen in both the ranges. The more common birds like the Common Myna, the Spotted Dove, the Black Drongo, the Grey Wagtail and the Wire-tailed Swallow are seen practically everywhere. The Spotted Dove is by far the most common bird in the Velamundy Reserved Forest and groups of twos are commonly seen all over. Other birds such as the Grackle, the Pea-fowl, the Crow Pheasant, the Crimson-breasted Barbet, the Racket-tailed Drongo, the Rose-ringed Parakeet, the Grey Partridge and the Painted Partridge are restricted only to the hills and foot hills of Mettupalayam Range.

94. The Bhavanisagar Lake and its surroundings are frequented by a wide variety of feathered inhabitants such as the Pond Heron and the Grey Heron, the little Cormorant and the Large Cormorant, the Cattle Egret, the White breasted King-fisher, the Red-Wattled Lapwing and the Common Sandpiper. Of these, the more common water birds such as the

Cattle Egret and the Pond Heron are found all along the main canal and one can hardly miss them while cycling along the canal bund. A number of migratory birds are also said to visit the lake and at least one seasonal bird the Pin-tailed Duck was observed by the writer on a couple of occasions. The bird is a winter visitor and is found in pairs or flocks along the waters.

95. The reservoir abounds with a great variety of fishes, the rearing of which is handled by the Fisheries Department. *Catla*, *Rohu*, *Mrigal*, *Labeo*, Mahseer and Cat-fish are some of the fishes reared by the Fisheries Department. In addition to these, a great variety of smaller fishes exist naturally in the reservoir and in the Bhavani and Moyar rivers. The reservoir also consists of other acquatic animals such as Crocodiles, Turtles and Otters.

96. The common South Indian poisonous snakes like the Cobra, the Viper and the Krait are found in both the ranges. Besides these, a host of non-poisonous snakes exist everywhere.

CHAPTER III—UTILISATION OF THE PRODUCE.

SECTION 1—AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION.

97. Apart from Coimbatore, Mettupalayam, Punjai-Puliampatti and Avanashi, the rest of the population is mainly agricultural. Due to the low water table prevalent in the region and the comparatively poor precipitation that is received, bulk of the land is subjected to dry cultivation. The chief crops grown are millets, maize, groundnut, cereals and pulses. Tobacco is grown extensively around Bhavanisagar and Puliampatti. Water is generally lifted from the wells by power or diesel oil motors and sometimes by human labour using the age old *picottah*. Wet cultivation is therefore very limited. The Bhavanisagar Dam which was constructed solely with the intention of improving dry cultivation in the tract has however changed the situation to a great extent and much of the lands in its *ayacut* which were originally subjected to dry cultivation have now been converted into wet lands.

98. There has been an increase of population in the tract during the last fifty years by hundred per cent and more. The pressure of this ever expanding population is no doubt felt in some manner or the other by the forests within the region, which have hardly held their ground but yielded place to the demands of cultivation in some localities where land hunger is acute.

99. In the city of Coimbatore, the population is ever on the increase on account of its rapid industrial growth during the past two decades. The population of Coimbatore increased from 1,30,348 in 1941 to 1,97,755 in 1951; it is probably over $2\frac{1}{2}$ lakhs now and is still increasing. This large population although not having any direct bearing on the forests, requires fuel and other forest produce for its needs.

100. Mettupalayam, Avanashi and Puliampatti are the other urban areas in the region which also have shown a great increase in population during the past decade. While Mettupalayam forms a centre for export of agricultural produce to the Nilgiris and the Kundah Project areas, Puliampatti is a big business centre with a weekly *shandy* which is one of the biggest in the South.

101. *Hill tribes.*—There are no hill tribes in the forests of Bhavani Range. In the Mettupalayam Range, numerous forest settlements of ' Irulars ' are to be found. There are fourteen settlements of these jungle tribes inside the reserves with lands set apart for cultivation. In addition to these forest settlements, quite a number of them have been settled in the unreserves and *patta* lands adjoining the forest. These hill men grow millets principally and are utilised as unskilled labour for agricultural and forest work. They are permitted to collect minor forest produce from the reserves for their own use and to cut third-class timber and fuel for domestic and agricultural purposes. A statement showing the number and population of their settlements and the area of land leased out to them will be found in Chapter IV of Part I.

102. *Wants of the population.*—The chief demands of the people on the forests are for small timber for building and agricultural implements, fuel for domestic consumption, and for cottage industries such as jaggery making, lime and brick kilns, pottery, etc., pasture and penning facilities for cattle, and for bamboos.

103. The requirement of small timber for agricultural implements is as keen as before and must be expected to continue to be so for a long time to come. The plough share and the handle, the shaft and the yoke, have all to come chiefly from the forest, the unreserves being quite inadequate for the purpose. Similar is the case with small timber for rural housing.

104. The fuel requirements of villages are not so insignificant as they were a couple of decades ago. The tremendous increase in population has resulted in a proportionate increase in the demands for fuel for domestic use as also for the various cottage industries along the countryside. The pilfering of dry fuel from the reserves in the vicinity of the bigger villages is therefore a common feature.

105. There is also a large demand for bamboos of all kinds, both in the urban areas as well as in the surrounding villages.

106. The number of cattle grazed in the forest is very large. Such a large number is maintained by the ryots chiefly for the farmyard manure obtained. Besides, cattle breeding is a popular profession in the region.

SECTION 2—MARKETS AND MARKETABLE PRODUCTS.

107. *Coimbatore.*—Coimbatore City whose demands of forest firewood are rather heavy, absorbs about 50 per cent of the fuel output of the forests of Mettupalayam Range. The bulk of the requirements of the city are met with from supplies from the Bolampatti and Perianaickenpalayam Ranges, the Anamalais and the private and Government forests in the Kerala State.

108. *Mettupalayam.*—Next to Coimbatore, Mettupalayam ranks as the biggest market for the products of the region. Contractors of coupes in the Mettupalayam Range maintain depots at Mettupalayam for the sale of small timber, fuel and bamboos. Apart from domestic consumption of fuel which is quite considerable, the arecanut boiling industry at Mettupalayam uses up large quantities of firewood from the local coupes.

109. There is a small tanning industry at Mettupalayam using chiefly *Konnai* bark that is obtained locally.

110. Bamboos from Mettupalayam Range are partly consumed locally by the thriving basket making industry and partly exported to Coimbatore, Tiruppur and other places.

111. Due to keen demand for timber in Coimbatore district, it was decided to shift the Government Timber Depot at Nanjangud in Mysore State to Mettupalayam for sale of timber extracted in the Nilgiris. The timber depot which was opened during May 1960 in the Odanthorai Reserved Forest about 4 miles (6.44 kilometres) from Mettupalayam town has'nt been much of a success judged at least from the prices obtained during the past two years.

112. *Other towns.*—Other small towns such as Avanashi, Punjai-Puliampatti and Chennimalai are also markets of lesser importance for fuel and small timber produced in the region. The fuel needs of Avanashi and Puliampatti are met with from the fuel coupes of Mettupalayam Range and to a certain extent from trees grown on *patta* lands along the country side. The needs of Chennimalai panchayat have been so far met from the Chennimalai fuel series, but with the closing down of the series at the time of writing this plan, future supplies will have to come from Andhiyur Range in Coimbatore North Forest Division.

113. The shandy at Punjai-Puliampatti is an important market for small sized poles of teak and other miscellaneous species and bamboos which have a good demand in the surrounding tobacco growing villages for erecting sheds for curing the leaf.

114. *Sandalwood.*—Sandalwood extracted in the Mettupalayam Range is transported to Satyamangalm Depot in Coimbatore North Forest Division where it is sold in auction held twice annually. A small quantity of billets is kept in the District Forest Office for retail sale.

115. *Marketable products.*—Firewood, small timber, poles and bamboos extracted from the forests dealt with are readily marketable at Coimbatore or in the smaller towns within the region.

116. A small number of teak poles are obtained from clear-felling and thinning the Hulikal irrigated teak plantations. Of these, a sizeable quantity is supplied to the State Electricity Board for use as electric transmission poles. The demand for electric transmission poles is pressing and only a tiny fraction of this demand can be met with till the irrigated teak plantations which are being raised at Odanthorai come for felling.

117. Tamarind, Gallnuts, *Avaram* and *Konnai* bark are the chief minor forest produce collected by the lessees. All these products are easily sold. Honey, wax, deer and sambhur horns, and the valuable remains of dead animals are collected departmentally. The honey and wax are sent to the Forest Utilisation Officer, Madras, who bottles these articles and distributes them for retail sale all over the state.

SECTION 3—LINES OF EXPORT.

118. The only railway line of some use for the export of forest produce of the division is the broad guage section from Mettupalayam to Erode and Madras via Coimbatore.

119. The region as a whole is served by a good network of roads and cart tracks, but still large areas continue to have very poor communication facilities. These are the Pillur slopes, Hulikal Durg and the Nilgiri Eastern Slopes Reserved Forests. Of these the Pillur Slopes Reserved Forest will soon be rendered accessible as the Electricity Board have already aligned a *pukka* road connecting Pillur with Mettupalayam town to serve the Kundah Project Areas and is expected to be formed before the end of 1962.

120. The following statement shows the more important roads in the region which are used in the transport of forest produce :—

Name of the road or cart-track. (1)	*Authority maintaining the road.* (2)	*Areas served.* (3)
	Mettupalayam Range.	
Coonoor-Mettupalayam-Coimbatore road.	Highways Department ..	Serves fuel, bamboo and sandal areas north-west of Mettupalayam town.
Mettupalayam-Nellithorai road.	Do. ..	Serves fuel, bamboo and sandal areas west of Mettupalayam town.
Karamadai-Gedde road ..	Electricity Board ..	Serves sandal areas of the Manar Reserve Sandal Felling Series.
Mettupalayam-Kotagiri road.	Highways Department ..	Serves fuel, sandal and bamboo areas north of Mettupalayam town.
Mettupalayam-Kilkotagiri road.	Highways and Forest Departments.	Serves bamboo and sandal areas of the Nilgiri Eastern slopes and clearfelling coupes in the Odanthorai Reserved Forest.
Mettupalayam - Satyamangalam road.	Highways Department ..	Serves for transport of fuel from the Pethikuttai Series, drift and waifwood collected in the Bhavanisagar Reservoir and transport of sandalwood to Satyamangalam Depot.
Gajalhatti-Bhavanisagar road (lies within Coimbatore North Forest Division limits).	Forest Department	Serves for transport of drift and waifwood from the Bhavanisagar Reservoir and minor forest produce from the Nilgiri Eastern Slopes Reserved Forest.
	Bhavani Range.	
Bhavanisagar – Manthankarai road.	Bhavanisagar Township ..	Serves for transport of drift and waif wood collected in the Bhavanisagar Reservoir.
Kangayam-Chennimalai-Erode road* (via Perundurai).	Highways Department ..	Serves fuel areas in the Chennimalai Felling series.
Chennimalai-Erode road* (via Mugam Vellodu).	Do. ..	Do.
Uttukuli-Chennimalai Road*	Do. ..	Do.

*All these roads lie partly within the limits of Coimbatore North Forest Division.

SECTION 4—METHODS OF EXPLOITATION AND THEIR COST.

121. *Sandalwood.*—The exploitation of sandalwood is carried out departmentally at every stage. Dead trees standing or fallen in the forest are enumerated and uprooted in the forest and transported to the forest depot where they are rough-cleaned. Dead sapwood trees removed in the course of extraction are burnt at site. A flat rate of Rs. 0.05 per tree is paid for this work.

122. The rough cleaned wood is transported to Satyamangalm Sale Depot in Coimbatore North Forest Division where it is final cleaned, sorted out class-wise and sold. Neglecting wastage in conversion, etc., the cost of exploitation per ton of rough cleaned wood (exclusive of establishment and overhead charges) would work out as follows :—

	RS.	P.
(1) Cost of enumerating 200 trees at $2\frac{1}{2}$ paise per tree (assuming that 200 trees will yield a ton of heartwood on the average	5	00
(2) Cost of uprooting, rough cleaning and transport to forest depot at Re 0.50 per quarter	40	00
(3) Cost of transport to Satyamangalam depot over an average lead of 40 miles (64.38 kilometres) at Re. 0.78 per ton mile	31	20
Total cost of exploitation per ton ...	76	20
or Rs. 74.70 per metric tonne.		

123. The final cleaning charges are not detailed above as this is carried out in Satyamangalam Depot.

124. *Fuel and small timber.*—The method of extraction of fuel and small timber in the simple coppice coupes is entirely through the agency of contractors. The general practice adopted is the same as prevalent elsewhere in the state.

125. *Method of working.*—The annual coupe is surveyed and demarcated on the ground in accordance with the working plan map (wherever working plan prescriptions are followed) or as per the instructions of the District Forest Officer and divided according to its size into three or four strips. On receipt of permission to start working, the contractor starts felling in strip I. The contractor first proceeds to clear all undergrowth and fell all coppice and tree growth except reserved trees flush with the ground. The fuel and small timber are billetted and arranged in stacks sizing 5′ × 4′ × 3′ (1.52 metres × 1.22 metres × .91 metre) and is taken to weigh a ton (1.016 metric tonne) and then loaded into the lorry or cart as the case may be. The work is done on contract by a gang of mazdoors and the rates generally paid vary from Rs. 2.00 to Rs. 2.50 per stack. The fuel and small timber are then transported from the coupe either by cart or lorry depending upon the nature of the feeder road to the sale depots. Practically all the contractors maintain their own lorries, and carts are employed only when the roads are very bad as practically all the series can be reached by lorries during fair weather. Apart from the propulsion charges for the lorry, unloading charges at the other end have to be paid to a set of mazdoors which is generally Rs. 2.00 per trip. Carts are generally hired and the hire charges are Re. 0.50 per mile (to and fro). The sale depots are at Mettupalayam for coupes in the Mettupalayam Range and at Chennimalai for the only coupe in the Bhavani Range (Chennimalai Fuel Series) from where fuel or small timber is delivered to retailers or exported to other urban areas.

126. The engaging of mazdoors and supervision in each coupe is entrusted to an agent who is paid at rates varying Rs. 30 to Rs. 50 per month.

127. On satisfactory completion of felling in strip I, the contractor is allowed to commence work in the next strip provided he has paid his dues under the terms of the contract.

128. Brushwood and such fuel of small dimensions as would be unremunerative to cart is sold by the contractor on head-load permits to the local villagers for their domestic use.

129. *Bamboos.*—All exploitation of bamboos is done through the agency of contractors. Bamboo coupes are leased out to contractors who employ labour for collection under the supervision of an agent who is paid about Rs. 50 per mensem. Cutter's chits are issued

by the contractor to the labourers to authorise their entry into the reserved forest. Bamboos of different sizes are extracted from the leased out coupes and dragged to road side depots from where they are transported by carts or lorries to Mettupalayam. Dead bamboos which cannot be utilised as whole are split and tied into bundles and transported for sale as fuel. A small quantity of green bamboos are also split for sale as fencing material. The following rates prevail for the collection of bamboos :—

Description of size.	*Felling, collection and delivery charges at roadside depot.*
	RS. nP.
Bottom pieces 18 feet to 20 feet (5·49 to 6·01 metres) long and 18 inches to 24 inches (45.7 to 61.0 centimetres) in girth (*Yettukole thattai*)	0 75
Bottom pieces 15 to 20 feet (4·57 to 5·49 metres) long and 18 inches to 24 inches (45.7 to 61.0 centimetres) in girth (*Arukole-thattai*)	0 75
Bottom pieces 12 feet to 14 feet (3·66 to 4·27 metres) long and 9 to 12 inches (22.9 to 30.5 centimetres) in girth (*Aruvatheri* or *Rasippottu*	0 25
Bottom pieces 15 to 17 feet (4.57 to 5.18 metres) (30.5 to 38.1 centimetres) in girth (*Ambatheri* or *Mathuraipoottu*)	0 50
Bottom pieces 10 to 14 feet (3·05 to 4·27 metres) long and below 6 inches (15.2 centimetres) in girth (*Nooreri* or *Nathi*)... ...	0 10
Dead bamboos (per cart-load)	3 00

130. The cost of transport by lorry or cart is the same as for fuel and small timber.

131. *Teak plantations.*—All saleable produce obtained from the small irrigated teak plantations at Hulikal are converted and sold. The produce obtained is converted into timber (mostly poles) and fuel. Timber conforming to the specifications of the Electricity Board are converted into Electric Transmission poles and handed over to the Board after they are passed by the Forest Utilisation Officer. The Board pays the Forest Department at rates specified by the Chief Conservator of Forests from time to time. The following are the current rates paid for enumeration, marking, felling, conversion and transport of poles to the forest depot.

Item of work.	*Rate per acre.*
	RS. P.
1 Enumeration and marking the tree for felling	4 00
2. Clear-felling and conversion	25 00
3 Transport to the Forest Depot at the Ghat road over a distance of 4 furlongs (.81 kilometres)	0 14

132. The thinned produce is converted into poles adopting the classification noted below :—

Below 12 inches (30.48 centimetres).

13 to 18 inches (33.02 to 45.72 centimetres).

19 to 24 inches (48.26 to 60.96 centimetres).

25 to 30 inches (63.50 to 76.00 centimetres).

31 to 36 inches (78.74 to 91.44 centimetres).

Over 36 inches (91.44 centimetres).

133. *Minor forest produce.*—Barring honey, wax, ivory, deer and sambhur horns, the right to collect all the other minor forest produce is leased out every year. The collection of various minor forest produce is through labour specially employed by the lessees for this purpose. The labour is generally paid for the quantity that is collected. Collection of

shekoy (pods of *Acacia concinna*) is generally entrusted to Irulars as the job of collecting pods amidst thorny bushes is a thing which the village labour is not capable of. Collection of other minor forest produce like Tamarind, *Avaram* and *Konnai* bark, Gallnuts, *Poochakottai* (fruits of *Sapindus emarginatus*), etc., is entrusted to either village or Irular labour specially employed for this purpose. Contractors pay for the collection of different kinds of minor forest produce at the following rates.

Description of item.	*Collection and delivery charges at road head or depot.* RS. P.	
Tamarind	3 50	per bag.
Avaram bark	3 00	per maund.
Konnai bark	2 00	Do.
Poochakottai	2 00	per bag.
Shekoy	2 00	Do.
Gall-nuts	3 00	Do.
Sundakkai	5 00	Do.

(*Note.*—1 maund = 37·32 kilograms.)

134. The right to collect honey and wax were leased out along with the other minor forest produce until 1958, when it was decided to institute departmental collection and sales in respect of these produce to prevent adulteration in the market. Collection of honey and wax is done through Irular labour who are adept in this job. The following are the rates paid by the department for collection and delivery at the Mettupalayam Range Office :

	RS. P.	
Honey	7 50	per quarter.
Wax	6 00	Do.

(1 quarter = 12·20 kilograms).

Note.—Honey and wax are not available for collection in the Bhavani Range.

135. The collected honey is sent to the Forest Utilisation Officer, Madras, where it is bottled and sold. A few bottles of honey are sent to the District Forest Officer for retail sale.

136. Deer and sambhur horns and the valuable remains of dead animals in the forest are collected departmentally as the contractors' may not confine their collection to those lying on the forest floor. These are sent to Satyamangalam Sale Depot in the Coimbatore North Forest Division for sale.

137. Quarrystone and gravel are sold to the public from approved quarries within the reserved forests under cover of seingiorage permits issued by the Range Officers. The individual who thus obtains permission to quarry, employs his own mazdoors. This stone is blasted by a special set of labourers. The blasted stone is then broken down into smaller bits called rough stone. The latter is generally rough-squarred by skilled stone-cutters and then transported. The stone-cutters are paid on piece work contract at the following rates :—

Descripton of produce.	*Rate.*
Rough squarred stone	Rs. 5·00 per 100 stones.
Metal 1½" thick per 100 cubic feet ..	Rs. 12·00 per 100 cubic feet.
Cut square stone	Rs. 20·00 per 100 cubic feet.
Chiselled stone	Rs. 30·00 per 100 cubic feet.
Stone slabs	Rs. 1·50 per square foot.
Stone pillars (4 to 6 feet in length) ..	Rs. 5·00 per pillar.

SECTION 5—PAST AND CURRENT PRICES.

138. The prices realised for fuel and bamboo coupes from 1956–57 to 1961–62 are exhibited in the sub-joined statements. Figures prior to 1956 are not quoted as they are already covered by Mahmood Hussain's working plan.

139. *Prices realised for bamboo coupes—*

Name of Bamboo Series

Mettupalayam Range.

Year of working.	*Hulikal.*		*Kallar.*		*Jaccanare.*		*Uliyur.*	
(1)	(2)		(3)		(4)		(5)	
	RS.	P.	RS.	P.	RS.	P.	RS.	P.
1956–57	805	00	1,020	00	2,365	00	1,265	00
1957–58	1,551	00	1,500	00	2,400	00	2,110	00
1958–59	700	00	2,005	00	2,000	00	810	00
1959–60	3,001	00	1,990	00	3,500	00	1,510	00
1960–61	1,801	00	1,655	00	4,001	00	2,300	00
1961–62	7,000	00	6,999	00	10,001	00	10,000	00

NOTE.—There are no bamboo coupes in Bhavani Range.

140. The following are the prices obtained from sale of timber, poles and fuel stacks from thinnings and final fellings in the Hulikal Teak Plantations in the Mettupalayam Range. The entire produce seems to have been sold as one lot.

1957–58	Sent to timber depot for sale.
1958–59 } 1959–60 }	Rs. 2,999·00
1960–61 } 1961–62 }	Rs. 5,000·00 (includes thinned poles for the past 2 years).

141. *Prices realised for fuel coupes per acre—*

Name of fuel series

(a) Mettupalayam Range.

Year of working.	*Sundapatti.*		*Jaccanare.*	
	RS.	P.	RS.	P.
1956–57	101	90	203	00
1957–58	20	00	101	00
1958–59	121	00	101	00
1959–60	270	00	200	00
1960–61	262	00	471	00
1961–62	180	00	400	00

(b) Bhavani Range.

Year of working.	*Chennimalai.*		
	RS.	P.	
1956–57	113	00	
1957–58	..		
1958–59	..		
1959–60	18	00	for coupe III and Rs. 9·00 for coupe IV (both were sold the same year).
1960–61	46	00	for coupe II and Rs. 7·00 for coupe V (both were sold the same year).
1961–62	54	00	

NOTE.—Only coupes I, II, III, IV, V and VI have been sold.

142. The prices obtained for minor forest produce during the past 5 years are given below :—

Name of unit.	*Produce leased out.*	*Prices obtained.* 1956–57.	1957–58.	1958–59.	1959–60.	1960–61.	1961–62.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		(a) Mettupalayam Range.					
		RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
Entire range	Gallnuts	760 00	802 00	..	501 00	999 00	305 00
Entire range	*Konnai* bark	..	..	..	..	2,111 00	..
Entire range	*Avaram* bark	1,845 00	2,000 00	2,000 00	2,000 00	1,903 00	..
Entire range	Tamarind	715 00	700 00	580 00	755 00	465 00	495 00
Entire range	Fodder grass	..	..	..	..	..	..
Entire range	Other minor forest produce.	2,005 00	2,150 00	3,000 00	2,599 00	2,171 00	3,001 00
Entire range	Rubber latex	50 00	..	..	—	—	..
Panchayat forests only	*Avaram* bark	1,000 00	1,250 00	1,800 00	1,501 00	—	..
Panchayat forests only	Other items of minor forest produce.	..	..	..	—	..	..
Entire range	Usufructs of 86 fruit trees ..	60 00	65 00	68 00	—	—	..
Entire range	Stone and tree moss ..	..	..	..	102 00	—	..
		(b) Bhavani Range.					
Velamundy Ex-panchayat Reserved Forest.	*Avaram* bark	..	805 00	1,303 00	855 00	861 00	1,000 00
Erode taluk	*Avaram* bark	..	..	105 00	100 00	..	..
Erode taluk	Tamarind	..	..	..	..	16 00	Not sold

NOTE.—Konnai bark was sold once in three years. Blanks noted for other items represent years during which they were not sold due to lack of demand or other reasons.

143. *Sandalwood*.—The following statement shows the average price obtained per ton of sandalwood at the Satyamangalam Depot during the past ten years.

Year.	Average rate per ton (1·016 metric tonne).
(1)	(2)
	RS. P.
1952–53	2,629·00
1953–54	2,943·50
1954–55	3,135·62
1955–56	4,681·44
1956–57	4,802·50
1957–58	3,673·00
1958–59	4,732·00
1959–60	5,599·00
1960–61	7,026·00
1961–62	7,431·00

144. The prevailing sale prices for different kinds of forest produce are given below.

145. *Mettupalayam Government Depot*.—The prices obtained for the various classes and grades of timber from Nilgiris Division and sold at Mettupalayam Timber Depot are as follows :—

Species.	Class of timber.		Average price per cubic foot of timber and poles obtained during the year 1961–62.
(1)	(2)		(3)
			RS. P.
Teak. ..	TRA I ..	Straight and sound logs 8 feet (2·44 metres) and up in length and sixty inches (152·40 centimetres) and up in girth.	..
Do. ..	TRA II ..	Straight and sound logs 8 feet (0·244 metres) and up in length and forty-eight inches (121·92 centimetres) to 59 inches (149·86 centimetres) in mid-girth.	..
Do. ..	TRA III ..	Straight and sound logs 8 feet (2·44 metres) and up in length and 35 inches to 47 inches (88·90 to 119·38 centimetres) in mid-girth.	..
Do. ..	TRB I ..	Logs 8 feet (2·44 metres) and up in length with minor defects and 60 inches (152·40 centimetres) and up in girth.	18 37
Do. ..	TRB II ..	Logs 8 feet (2·44 metres) and up in length with minor defects and 48 inches to 59 inches (121·92 to 149·86 centimetres in mid-girth.	14 52
Do. ..	TRB III ..	Logs 8 feet (2·44 metres) and up in length with minor defects and 36 to 47 inches (91·44 to 119·38) centimetres in mid-girth.	12 25
Do. ..	TRC I ..	Logs 8 feet (2·44 metres) and up in length not qualifying for the A and B classes but with bad shape and major defects and 60 inches (152·40 centimetres) and up in girth.	15 20

Species. (1)				Class of timber. (2)	Average price per cubic foot of timber and rates obtained during the year 1961–62. (3) Rs.	P.
Teak ..	..	TRC	II ..	Logs 8 feet (2·44 metres) and up in length not qualifying for the A and B classes but with bad shape and major defects and 36 to 59 inches (91·44 to 149·86 centimetres) in mid-girth.	10	08
Do.	..	TRSL	..	Logs between 4 feet and 8 feet (1·22 metres and 2·44 metres) in length and 36 inches (91·44 centimetres) and above in girth.	10	57
Do.	..	TP	I ..	Teak poles 15 feet (4·57 metres) and up in length and 24 to 35 inches (60·96 to 88·90 centimetres) in mid-girth.	..	
Do.	..	TP	II ..	Teak poles 10 inches to 15 feet (3·05 to 4·57 metres) in length and 24 to 35 inches (0·61 to 0·89 centimetres) in mid-girth.	..	
Do.	..	TP	III ..	Teak poles 15 feet (4·47 metres) and up in length and 12 to 35 inches (30·48 to 88·90 centimetres) in mid-girth.	..	
Do.	..	TP	IV ..	Teak poles 10 to 15 feet (3·05 to 4·57 metres) in length and 12 to 35 inches (30·45 to 88·90 centimetres) in mid-girth.	..	
Do.	..	TPC	..	Teak poles 12 to 35 inches (30·45 to 88·90 centimetres) in mid girth and not qualifying to any of the four classes mentioned above.	..	
Do.	..	TPUS	..	Teak poles under sized-10 feet (3·05 metres) and up in length and 9 inches (22·86 centimetres) in mid-girth.	..	
Rosewood	..	RWA	I ..	Straight and sound logs 8 feet (2·44 metres) and up in length and 60 inches (152–40 centimetres) and above in mid-girth.	96	72
Do.	..	RWA	II ..	Straight and sound logs 8 feet (2·44 metres) and up in length, and 48 inches to 59 inches (121·92 to 149·86 centimetres) in mid-girth.	21	60
Do.	..	RWB	I ..	Logs 8 feet (2·44 metres) and up in length with minor defects and 60 inches (152·40 centimetres) and above in mid-girth.	38	22
Do.	..	RWB	II ..	Logs 8 feet (2·44 metres) and up in length with minor defects and 48 to 59 inches (121·92 to 149·86 centimetres) in midgirth.	22	78
Do.	..	RWC	..	Logs not qualifying to the above classes due to major defects, 8 feet (2·44 metres) and up in length and 48 inches (121·92 centimetres) and up in mid-girth.	4	93
Do.	..	RWPA	..	Sound poles 8 feet (2·44 metres) and up in length and 25 to 47 inches (63·50 to 119·38 centimetres) in mid-girth.	7	53
Do.	..	RWPB	..	Poles 8 feet (2·44 metres) and up in length and 25 to 47 inches (63·50 to 119·38 centimetres) in mid-girth, but not qualifying for RWPA class.	7	48

Species. (1)	Class of timber. (2)		Average price per cubic foot of timber and poles obtained during the year 1961–62. (3) RS. P.
Haiti or *Karu-marudu* (*Terminalia tomentosa*).	MRA ..	Straight and sound logs 8 feet (2·44 metres) and up in length and 48 inches (121·92 centimetres) and up in mid-girth.	5 77
Do. ..	MRB ..	Logs 8 inches (2·44 metres) and up in length and 48 inches (121·92 centimetres) and up in mid-girth, but not qualifying for A class.	5 50
Nanthi or Ven-teak *Lagerstroemia lanceolata*).	NRA	Straight and sound logs 8 feet (2·44 metres and up in length and 48 inches (121·92 centimetres) and up in mid-girth.	4 70
Nanthi	NRB	Logs 8 feet (2·44 metres) and up in length and 48 inches (121·92 centimetres) and up in mid-girth but not qualifying for the A class.	4 15
Aini (*Artocarpus hirsuta*).	Aini A ..	Straight and sound logs 8 feet (2·44 metres) and up in length and 48 inches (121·92 centimetres) and up in mid-girth.	4 73
Aini	Aini B ..	Logs 8 feet (2·44 metres) and up in length and 48 inches (121·92 centimetres) and up in mid-girth, but not qualifying for the A class.	3 87
Aini	Aini poles ..	Straight and sound poles 8 feet (2·44 metres) and up in length and 36 to 47 inches (91·44 to 119·38 centimetres) in mid-girth.	..

***Private depots at Mettupalayam*—**

(i) Small timber—

Teak (in round)	..	Rs. 5·00 to 25·00 per cubic foot.
Junglewood (in round)	..	Rs. 3·00 to 5·50 per cubic foot.
Teak scantlings.	..	Rs. 27·00 to 35·00 per cubic foot.
Jungle scantlings.	..	Rs 7·50 to 10·00 per cubic foot.
Teak planks.	..	Rs. 35·00 to 50·00 per cubic foot.
Junglewood planks	..	Rs. 10·00 to 13·50 per cubic foot.
Teak reepers	..	Rs. 140.00 to 150·00 per 1,000 running feet.
Junglewood reepers	..	Rs. 85·00 to 90·00 per 1,000 running feet.

(ii) Fuel—

Tamarind fuel (in round billets)	..	Rs. 52·00 to Rs. 55·00 per ton.
Anogeissus fuel (in round billets)	..	Rs. 50·00 per ton.
Miscellaneous fuel (in round billets)	..	Rs. 40·00 to Rs. 50·00 per ton.
Tamarind fuel (splitted)	..	Rs. 57·00 to Rs. 60·00 per ton.

(iii) Bamboos—

Bottom pieces 18 to 20 feet (5·49 to 6·01 metres) and 18 to 24 inches (45·7 to 61·00 centimetres) in girth (*Yettukolethattai*)—Rs. 75·00 to Rs. 100·00 per 100.

Bottom pieces 15 to 20 feet (4·57 to 6·01 (metres) long and 18 to 24 inches (45·7 to 61·0 centimetres) in girth (*Arukolethattai*)—Rs. 50·00 to Rs. 70·00 per 100.

Bottom pieces 12 to 14 feet (3·66 to 4.27 metres) long and 9 to 12 inches (22·9 to 30·5 centimetres) in girth (*Aruvatheri*)—Rs. 35·00 to Rs. 50·00 per 100.

Bottom pieces 15 to 17 feet (4·57 to 5·18 metres) long and 12 to 15 inches 30·5 to 38·1 centimetres) in girth (*Ambatheri*)—Rs. 40·00 to Rs. 55·00 per 100.

Bottom pieces 10 to 14 feet (3·05 to 4·27 metres) long and below 6 inches (15·2 centimetres) in girth (*Noorari*)—Rs. 15·00 to Rs. 20·00 per 100.

Bottom pieces 15 to 17 feet (4·57 to 5·18 metres) long and 9 to 10½ inches (22·9 to 26·67 centimetres) in girth (*Nathi* I variety)—Rs. 7·50 to Rs. 13·70 per 100.

Private depots at Punjai Puliampatti—

(i) Small timber.—

Teak (in round)	..	Rs. 15·00 to 20·00 per cubic foot.
Junglewood (in round)	..	Rs. 5·00 to 7.00 per cubic foot.
Teak scantlings	..	Rs. 25·00 to 40·00 per cubic foot.
Teak planks	..	Rs. 35·00 to 45·00 per cubic foot.
Junglewood planks	..	Rs. 8·00 to 16·00 per cubic foot.
Teak reepers	..	Rs. 145·00 to 160·00 per 1,000 running feet.
Junglewood reepers	..	Rs. 90·00 to 95·00 per 1,000 running feet.

(ii) Fuel—

Tamarind fuel (in round billets)	..	Rs. 45·00 to 50·0 per ton.
Anogeissus fuel (in round billets)	..	Rs. 45·00 to 50·00 per ton.
Miscellaneous fuel (in round billets)	..	Rs. 40·00 to 45·00 per ton.
Tamarind fuel (splitted)	..	Rs. 47·00 to 52·00 per ton.
Miscellaneous fuel (splitted)	..	Rs. 42·00 to 47·00 per ton.

(iii) Bamboos—

Bottom pieces 18 to 20 feet (5·49 to 6·01 metres) long and 18 inches to 24 inches (45·7 to 61·0 centimetres) in girth (*Yettukolethattai* or *Thattai*)—Rs. 125·00 per 100.

Bottom pieces 15 to 20 feet (4·57 to 5·49 metres) long and 18 to 24 inches (45·7 to 61·0 centimetres) in girth (*Arukolethattai* or *Thattai*—Rs. 100·00 per 100.

Bottom pieces 12 to 14 feet (3.66 to 4·27 metres) long and 9 to 12 inches (22·9 to 30·5 centimetres) in girth (*Aruvatheri* or *Rasipoottu*)—Rs. 45·00 per 100.

Bottom pieces 15 to 17 feet (4·57 to 5·18 metres) long and 12 to 15 inches (30·5 to 38·1 centimetres) in girth (*Ambatheri* or *Mathuraipoottu*)—Rs. 65·00 per 100.

Bottom pieces 10 to 14 feet (3·05 to 4·27 metres) long and below 6 inches (15·2 centimetres) in girth (*Nooreri* or *Nathi*)—Rs. 17·50 per 100.

Bottom pieces 11 to 13 feet (3·35 to 3·96 metres) long and 6 to 7·5 inches (15·2 to 19·07 centimetres) in girth (*Nathi* or *Karanai*)—Rs. 13·50 per 100.

CHAPTER IV—STAFF AND LABOUR.

SECTION 1—STAFF.

146. The existing establishment in the two ranges is given in the following statements :—

(a) *Mettupalayam Range*—

1 Range Officer.
1 Assistant Range Officer solely for the Odanthorai irrigated teak plantations.
1 Range clerk.
2 Peons.
2 Section Foresters.
4 Special duty Foresters solely for the Odanthorai irrigated teak plantations.
9 Forest Guards.
8 Special duty Forest Guards solely for the Odanthorai teak plantations.
4 Reserve Watchers.
1 Forest Guard in charge of tanah at Mettupalayam.
1 Special duty Forest Guard at the disposal of the Range Officer, Mettupalayam for special works.

(b) *Bhavani Range*—

1 Range Officer.
1 Range clerk.
1 Range peon.
2 Section Foresters for the two sections and
1 Special duty Forester at Chennimalai under the soil conservation scheme.

5 Forest Guards.

2 Special duty Forest Guards for the Soil Conservation Scheme.

5 Reserve Watchers.

(c) *Mettupalayam Timber Depot*—

1 Depot Range Officer.

1 Forester.

1 Peon.

1 Depot Watcher.

1 Tally clerk.

SECTION 2—LABOUR SUPPLY.

147. In the Mettupalayam Range, some difficulty is experienced in procuring unskilled labour for regeneration works in the Odanthorai Reserved Forest. Labour for the teak plantations is largely drawn from the surrounding villages as hill men are unable to stand up to this hard work. Mazdoor lines with water supply and other minimum facilities have been provided at Odanthorai where imported labour is brought for work in the irrigated teak plantations. A lorry is also provided to transport mazdoors from the adjoining villages to the work spots. But these incentives have not been sufficient to attract mazdoors in large numbers as higher wages are paid by potato merchants and private firms such as the South Indian Viscose Company, Limited. Elsewhere for other routine departmental works such as sandalwood extraction, fire protection and other cultural operations, no dearth of unskilled labour is felt owing to the large number of hill tribes settled in the reserved forests.

148. For other works such as building construction and road repairs, skilled labour like carpenters, masons, quarry men, stone cutters, etc., are required. They can be recruited locally from the villages on the plains. The Odders or Boyans are a professional class of skilled mazdoors adept in masonry work. They originally hailed from Satyamangalam taluk, but have now settled down all over the district in search of employment.

149. In the Bhavani Range, the only departmental work of any magnitude is the raising of small-scale regeneration and grass plots year after year, and their maintenance. No hill men are settled in the tiny reserves of this range, and labour has to be therefore entirely drawn from the villages adjacent to the forests.

150. *Hill tribes.*—The jungle tribes settled in the Mettupalayam Range are the Irulars. They speak a dialect closely akin to Tamil. East Irular settement or *pathy* as they call them consists of a few thatched huts in which four or more families live, around which they cultivate *ragi*, *cholam*, *varagu* and other dry crops. With the land proving infertile after a few years' use, they used to migrate to fresh areas thereby practising shifting cultivation. With a view to settle them permanently and put an end to the pernicious practice of shifting cultivation, they have been allotted lands free of assessment inside the reserved forests which they cultivate under an annual lease as tenants at will of the Forest Department. There are fourteen such *pathys'* at present. Out of these, eight settlements have been abandoned since some years, but there is a proposal to reopen them on account of demand from the original settlers. The main conditions of lease are :—

(1) The lands are enjoyed free of rent.

(2) Any alienation of the land is prohibited.

(3) The lessee shall assist the Forest Department as mazdoors on payment of wages fixed from time to time by the District Forest Officer in such forest works as they may be called upon to do within 10 miles (16.09 kilometres) from each settlement.

(4) They may cut and remove for their own use, but not for sale, within the limits of the land assigned, third class timber, firewood, bamboos and grass.

(5) They shall act as Forest Police within their specified limits and give information of any offences committed to the Range Officer. They will prevent all fires within the said area and should any fire start in the limits prescribed, they will at once take steps to put it out.

(6) They shall make every endeavour to establish sandalwood trees alongside the hedge rows forming the boundaries of the area taken up for cultivation free of cost to the Government in such manner and in such areas as may be directed by the District Forest Officer.

151. The statement given below exhibits the number of families in each settlement and also the extent of land set apart for each settlement within the reserved forests.

Serial number and name of the settlement.	Area allocated in. Acres.	Hectares.	Number of families.	Name of the hill tribe.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
1. Melapillur	68·78	(27·76)	7	Irulars.	..
2. Kilpillur	43·00	(17·40)	10	Do.	..
3. Unjalanaicombai ..	22·90	(9·26)	8	Do.	..
4. Morikodu	58·72	(23·76)	8	Do.	..
5. Ulliyur	74·00	(29·95)	24	Do.	Abandoned, but there is a proposal to re-open the settlement.
6. Ariyur	..	..	..	Do.	Do.
7. Sitheguni	..	..	..	Do.	Do.
8. Veerakkal	..	..	..	Do.	Do.
9. Korapathi	..	..	..	Do.	Do.
10. Manar	..	..	..	Do.	Do.
11. Sundapatti	..	..	..	Do.	Do.
12. Kilsengal	..	..	..	Do.	Do.
13. Geddaikadu	..	..	..	Do.	Do.
14. Uppupallam	..	..	..	Do.	Do.

152. Each *pathy* or settlement has its own headman or *moopan* as he is called, whose decision is always considered final in matters of petty dispute among themselves and is their spokesman to the outside public and officers of the Government.

153. The settlements are by no means in a flourishing state. The plains contractors' employ them for collection of minor forest produce for a number of months and keep them under their firm hold. Improvement in their standard of living is not possible so long as some type of exploitation of their labour exists which denies them the full benefit of their labours.

154. During the past few years a few amenities have been afforded to them by the State Harijan Welfare Department in the form of *pucca* buildings and a school at Kunjapanai, but their condition is still very backward and needs amelioration.

155. *Wages.*—The following statements give details of approved wages for skilled and unskilled labour in the Mettupalayam and Bhavani Ranges during the year 1961–62.

(a) *Unskilled labour*—

(1)	Man. (2)	Woman. (3)	Boy. (4)
	RS. P.	RS. P.	RS. P.
Mettupalayam Range	1 86	1 39	1 15
Bhavani Range	1 86	1 39	1 15

156. There are two types of Reserve Watchers, one with a basic pay of Rs. 13 and another with Rs. 10. The allowance for both grades are the same.

(b) *Skilled labour*—

(1)	Mason. (2)	Carpenter. (3)	Sawyer. (4)	Quarrymen. (5)	Stone cutter. (6)	Remarks. (7)
	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	
Mettupalayam Range ..	3 30	3 30	3 30	3 30	3 30	..
Bhavani Range	3 30	3 30	3 30	3 30	3 30	..

157. These rates are fixed by the Conservator of Forests annually in the forest schedule of rates in accordance with the prevailing local conditions and are therefore subject to revision every year.

CHAPTER V—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

SECTION 1—GENERAL HISTORY OF THE FORESTS.

(a) Early history of the forests.

158. The district of Coimbatore came into the possession of the East India Company in 1799 on the capture of Seringapatam and the death of Tipu Sultan. During the Sultan's regime, sandalwood was a royal tree and no private rights to it were recognised. Though little is known of the history of the sandal forest in Coimbatore, there can be no doubt that much plunder and smuggling of sandalwood took place during these unsettled times.

159. The Madras Forest Department was constituted in 1856 with Dr. H. Cleghorn as Conservator of Forests.

160. In the early years of the department, the practice was to allow the free removal of fuel and other forest produce except Teak, Rosewood, *Vengai*, Sandalwood and Tamarind. It is probable that this arrangement was traditional from pre-British times and it was allowed to continue for a number of years after the British acquired possession of the forests.

161. With a view to prevent the unrestricted felling of wood and the consequent destruction of jungles, to conserve the more valuable trees from the danger of extinction and also to bring uniformity in the treatment of forest produce throughout every district in the Presidency, the Board of Revenue issued in 1860, a circular which consisted of a simple set of rules called the Jungle Conservancy Rules. These rules which came into operation in the Coimbatore district in March 1868, regularised the removal of forest produce by the issue of free permits for all species, except the five mentioned in the preceding paragraph for agricultural and domestic purposes only. For other purposes, definite nominal charges were fixed, which varied according to the species and the produce. Sandalwood was not allowed to be cut. The monigars of the villages were the permit issuing officers, the permits being supplied by the Tahsildars.

162. The uncontrolled permit system continued to be in force till late in the nineties when unsuccessful attempts were made to restrict licences to coupes.

163. From all available accounts, it appears that organised exploitation of sandalwood in these forests took place for the first time about the year 1860–61. Captain W. H. Morgan, Conservator of Forests with headquarters at Ootacamund makes a reference to this in his annual report for the year. The method followed was a regular cutting of all trees which have made heartwood and show signs of decay in their tops'.

(b) Administrative history of the forests.

164. The reservation of forests on the south-eastern slopes of the Nilgiris was first mooted in 1876–77, but the forests were ultimately reserved only in 1886. The Hulikal Durg forest was also reserved during the same year. The Velamundy, Kallar, Modur and Pethikuttai, Nellithorai and Sundapatti, Odanthorai and Aduthorai forests were all first reserved in 1885 although amended descriptions of these forests with further additions were made later. The Constantia Reserved Forest and Kallur Reserved Forest (portion) were reserved in 1891. The Jaccanare slopes Reserved Forest was reserved first in 1892 and the Melur Slopes Reserved Forest in 1893. The Pillur Slopes Reserved Forest was reserved in 1894. The Arachalur and Vellikaradu forests were reserved in 1896. The Kongampalayam forest was reserved in 1897 and the Voipadi forest in 1898. The Sennimalai and Nellimalai forests were reserved in 1900 and the Sandalwood Reserved Forests' I and II in 1902.

165. Soon after reservation, the forests now comprising of the Mettupalayam Range were included in the Coimbatore South Forest Division. The Velamundy Reserved Forest was included in the Coimbatore North Forest Division as part of the Satyamangalam

Range. The Sennimalai, Vellikaradu, Arachalur, Voipadi and Kongampalayam Reserves also formed part of the Coimbatore North Forest Division but the actual range in which they were included is not known now. The Coimbatore North Forest Division then comprised of three ranges, viz., Kollegal, Satyamangalam and Bhavani Ranges. In December 1892, the Satyamangalam Range was divided into two ranges, viz., Talamalai and Satyamangalam Ranges, and the Velamundy forests were included in the Talamalai Range.

166. In 1909, when the forest charges in the Coimbatore District were divided into four (North, South and Central Coimbatore, and Kollegal Divisions), the Mettupalayam Range was included in the Coimbatore Central Forest Division while the Talamalai Range continued to be part of the Coimbatore North Forest Division.

167. In 1909–10, the Nilgiri Eastern Slopes Reserved Forest was transferred to the Coonoor Range of Nilgiris Forest Division, but was returned to the Mettupalayam Range in July 1920.

168. In 1921, the Coimbatore Central Forest Division was abolished and the Mettupalayam Range was transferred to the Coimbatore North Forest Division.

169. In 1926–27, the Nellimalai, Odanthorai, Modur and Pethukuttai, Velamundy, Voipadi, Kongampalayam, Sennimalai, Vellikaradu and Arachalur Reserved Forests were transferred to Panchayat management.

170. With the abolition of forest panchayats, these areas reverted back to the Forest Department in 1951. The Nellimalai, Odanthorai, Modur and Pethikuttai Reserves were included in the Mettupalayam Range as before and the Velamundy Reserved Forest in the Talamalai Range. The Voipadi, Kongampalayam, Sennimalai, Vellikaradu and Arachalur Reserves were included in the Satyamangalam Range.

171. In 1955, the Voipadi, Kongampalayam, Sennimalai, Vellikaradu and Arachalur Reserves were included in the Bhavani Range which then consisted also of the forests of the present Andhiyur Range.

172. On 1st June, 1956, a new plantation range was formed at Mettupalayam for raising irrigated teak plantations in the Odanthorai Reserved Forest.

173. Following the reorganisation of states on 1st November 1956, a general reorganisation of the Forest Department took place on 1st February, 1957. The Mettupalayam Range and the Mettupalayam Irrigated Teak Plantations Range were transferred to the Coimbatore South Forest Division. The Bhavani Range was divided into two, viz., the Bhavani and Andhiyur Ranges and all the Bargur ghat faces were transferred to the latter. The Velamundy Reserved Forest of Talamalai Range was transferred to the new Bhavani Range.

174. In 1959, the Mettupalayam Range and the Mettupalayam Irrigated Teak Plantations range were retransferred to the Coimbatore North Forest Division.

175. On 1st January, 1960, the Thadagam Block IV (part), Anaikatti North (part), Kandiyur and Gopinari Reserved Forests which till then formed part of the Mettupalayam Range were separated out and annexed with a few other reserves taken out from the Bolampatti Range (then in Coimbatore South Forest Division) to form a new range called the Perianaickenpalayam Range. At the same time, the Irrigated Teak Plantations' Range was merged with the Mettupalayam Range and the Ranger in charge of the plantation range was posted as an assistant to the Range Officer, Mettupalayam.

176. In May, 1960, a Government Timber Depot was opened in the Odanthorai Reserved Forest a coupe of miles away from Mettupalayam town, for sale and disposal of timber extracted in the Gudalur Plateau of the Nilgiris. The administrative control over the depot was however vested with the District Forest Officer, Nilgiris.

177. In June 1961, the forests of Coimbatore underwent a further administrative change. The North and South Coimbatore Forest Divisions were trifurcated into North, South and Central divisions and the Mettupalayam, Bhavani, Perianaickenpalayam and Bolampatti Ranges and the Mettupalayam Depot were included as part of the new Coimbatore Central Forest Division.

(c) Introduction of working plans : The working plans era (1902 *to-date*).

178. It is not know whether any working plan or scheme was drawn to work the plains forests of Erode Taluk prior to their transfer to panchayat management in 1926–27.

179. The earliest working plan for the Mettupalayam Range was prepared by Foulkes in 1902. The plan was sanctioned by the Board of Revenue during the same year, but the prescriptions of the plan were not given into effect till 1904–05.

180. In 1915, Panchapakesa Ayyar prepared a general working plan for the whole Mettupalayam Range as it then was, but this was however not approved and was revised in 1917 by Habibullah.

181. The Nilgiri Eastern Slopes Reserved Forest which formed part of the Coonoor Range till 1920 was not covered by any working plan. However in 1925, a provisional working scheme which was prepared for three years was sanctioned by the Conservator. The working scheme was revised in 1927–28 by H.R.M. Law, the District Forest Officer under the instructions of the Conservator. The scheme was however not sanctioned pending the preparation of a general working plan for the entire Coimbatore North Division.

182. The Talamalai Range which included the Velamundy forests had its first working plan written by Hodgson in 1917. This plan was sanctioned by the Board of Revenue only in 1918. The same year a separate working plan for the Velamundy Reserve was drawn up by Dupre Thornton which continued to operate until the reserve was transferred to panchayat management in 1926–27.

183. In 1932, the first integrated working plan embracing the entire Coimbatore North Forest Division written up by C. R. Ranganathan came into effect. This plan was revised by V. S. Krishnaswamy and the revised prescriptions were brought to force from 1st April, 1943. Krishnaswamy's plan was revised by A. M. Mahmood Hussain. The prescriptions of Hussain's plan were brought into force from 1st April, 1956. This plan was drawn up for a fifteen-year period and is currently in force.

SECTION 2—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

184. The past systems of management of the forests of the region and their results are briefly described below.

A. Reserve Sandal.

185. Sandal occurs in exploitable quantities only in the Mettupalayam Range.

186. Ever since the organisation of the Forest Department, the exploitation of sandalwood was always done departmentally. No working scheme or plan was drawn up to work the sandal forests of Mettupalayam Range until the advent of Ranganathan's plan.

187. Up to 1914–15, the procedure followed in the clearing and marketing of sandal wood was to uproot the trees in the forest, rough chip them in *situ* and consign the rough-cleaned wood to the forest depot where the wood was finally cleaned in a *katcha* shed. The cleaned wood was then sent to Satyamangalam for sale.

188. In 1914–15, McCarthy (the then Conservator) introduced a stricter system of exploitation. The trees were first tested to find out if they contained any scented wood. Such trees were uprooted and rough cleaned in the forest. The rough cleaned wood was then sent under an invoice showing the number of pieces (but not the weight) to an intermediate or collection depot where it was immediately weighed and brought to account. From the colletion depot, the wood was despatched under invoice in convenient consignments to the main depot at Satyamangalam, where it was fnally cleaned and classified under the Coorg system into nineteen classes and sold in auction once a year.

189. In 1928–29, the Javadi system of extraction was introduced. This system involves a rigid and elaborate method of accounting and prescribes the reconstruction of the trees at the sale depot as a cardinal check. The procedure to be followed is described in detail in the official pamphlet entitled 'Rules regarding selection, felling, cleaning, classification and disposal of sandalwood and the method of maintaining depot accounts and other registers'.

190. Dibbling of sandal seeds in patches in portions of the Mettupalayam Range appears to have been done during the early years prior to Ranganathan's plan. The details of the technique adopted, the places thus tackled and the results achieved are not known.

191. *C. R. Ranganathan.* (1932–43)—in his working plan included the sandal forests of Mettupalayam Range under a Reserve Sandal Working Circle consisting of two felling series viz., (i) the Halur series and (ii) the Manar series. A felling cycle of six years was fixed with one coupe to be worked each year. Only dead sandalwood trees were extracted, rough cleaned and transported to Satyamangalam Depot for sale in accordance with the sandalwood felling rules. Ranganathan also enunciated a theory that the number of sandal trees which die in any girth class is a fixed proportion of the strength of that class and this proportion is uniform in all classes. The hypothesis was based on enumeration data for sandal in the Satyamangalam and Talamalai Ranges in the Coimbatore North Division. The Statistician, Forest Research Institute, Dehra Dun, to whom the hypothesis was referred to by Mahmood Hussain while he was revising the plan for North Coimbatore was opined that 'the probability of the hypothesis being true is neglibibly small'. (Mahmood Hussain). The actual yield which was however obtained during the period of the working plan also completely belied Ranganathan's hypothesis. The yield often ranged between wide extremes and was always rather erratic. Ranganathan also prescribed a regular tending of the sandal coupe of the year on a six-year cycle to be caried out at the time of enumeration. A special tending in some of the dense climber infested areas such as Constantia Reserved Forest and in the forests around Kunjapanai settlement were prescribed.

192. C. R. Ranganathan also prescribed the regeneration of sandal in small propagation centres along stream banks in favourable localities. However within a few years, the conclusion was reached that no sustained success was possible that way. C. R. F. Williams (then Conservator) summed up the position as follows in a field inspection note drawn up in 1942.

193. " Attempts to regenerate sandal by propagation centres have not been successful ; not that the growth of the young sandal failed uniformly, but where success was obtained spike has attacked the young trees and killed them off before any heartwood could be formed. The District Forest Officer showed me several places where he had obtained good regeneration results when he was previously in the division and where no sign of sandal now can be found. For this reason the new working plan is to prescribe raising sandal in concentrated plantations in conjunction with spike resistant hosts. "

194. The above suggestion of the Conservator was prescribed in the *revised working plan of V. S. Krishnaswamy* (1943–1956). He suggested a number of species such as Neem, *Perumungil*, *Sembulichan*, *Manjakonnai* (*Cassia siamea*), *Elandai*, (*Zizyphus mauratiana*), etc., to be spike immunizing hosts. Unfortunately none of these prescriptions were caried out in the areas constituting the present Mettupalayam and Bhavani Ranges. There were no major changes in the general prescriptions of V. S. Krishnaswamy in his Reserve Sandal Working Circle from that of the previous plan except in the sphere of general tending which was given up as rather unnecessary. A mere climber cutting at the time of enumeration was considered to be sufficient and this was prescribed.

195. The prescriptions of *Mahmood Hussain's revised working plan* (1956–to date) were the same as that of V. S. Krishnaswamy, except that no tending, climber cutting or artificial regeneration were prescribed. It was suggested that these operations may be taken up where necessary

B. Village Sandal

196. Apart from the reserved forests, sandal also occurs in the unreserves and some of the *patta* lands in the Mettupalayam Range. Whereas the sandal in the unreserves belong entirely to the Government, the right over sandal occurring on *patta* lands has been always a matter of controversy. The legal position of *patta* sandal has been fully discussed in Chapter I of Part I.

197. The extraction of sandal in the unreserves has been always done by the department. As a measure of protection, efforts are also made to purchase privately owned sandal trees at the *pattadar's* option at suitable rates to be fixed by the department. The extraction is however mainly confined to dead trees, although green trees are also extracted under certain special circumstances, viz., when agricultural crops are proposed to be raised on the land.

198. *C. R. Ranganathan* (1932–43) *in his working plan* for the Coimbatore North Forest Division constituted a Village Sandal Working Circle with only one felling series in the Mettupalayam Range. A three-year felling cycle was fixed with one coupe to be worked every year. Ranganathan also stressed the need for controlling the clearing of unreserves for *sivoijama* cultivation but practically nothing could be done in this direction. Rich sandal bearing unreserves were gradually brought under this type of cultivation with the depletion of sandal as an inevitable consequence.

199. There were no changes in the prescriptions for village sandal working in the revised working plan of V. S. Krishnaswamy (1943–1956) from that of Ranganathan's plan.

200. With the completion of the Lower Bhavani Project, much of the unreserves in the Mettupalayam Range were converted into *sivoijama* lands by persons displaced in the project areas. At present, village sandal working is confined only to three villages in the Mettupalayam Range, viz., Manar, Kunjapanai and Odanthorai. *Mahmood Hussin in his revised working plan* (1956 to-date) has constituted 3 villages into a single coupe which is worked every year.

C. Timber Working.

201. Some timber working appears to have been done in the Mettupalayam Range under the earlier plans.

202. *Habibullah's* 1917 *plan* created two timber working circles (apparently meaning felling series), one embracing the whole of the Kallar Reserved Forest and the other situated in the upper slopes of a portion of Jaccanare Reserved Forest. The growing stock consisted of small sized trees of *Vengai*, Rosewood, *Velvagai*, *Vellanagai* and *Vanni* (*Prosopis spicigera*) mixed with other valueless species. In order to improve the existing stock and to utilise all dead and deteriorating trees, improvement fellings on a felling cycle of 15 years were prescribed in both the working circles.

203. The prescriptions were not generally carried out. After an inspection of the areas in 1923, the Conservator decided that it was not worthwhile spending money on improvement fellings in the locality. In 1924–25, creeper cutting work was stopped in the coupes. These deviations amounting in effect to the formal abolition of the two timber working circles, were sanctioned in C.C.P. Rt. No. 451/29, dated 16th October 1929.

204. No timber working was prescribed in the later plans of C. R. Ranganathan and V. S. Krishnaswamy and in the current plan of Mahmood Hussain.

D. Fuel Working.

205. Organized fuel working in the Mettupalayam Range may be said to have been introduced in 1902 with the preparation of a working plan by Foulkes. Six fuel working circles and a ' compensation ' working circle were formed. The coupes were prescribed to be worked under the ' coppice with standards ' system on a rotation of 25 years. Practical effect was not given to the plan till 1904–05. From the very beginning the working deviated considerably from the provisions of the plan. Further as the demand for fuel was greater than could be met from the prescribed coupes, additional coupes under a system of located fellings were opened in the Sundapatti and Odanthurai West Reserves.

206. *The revised working plan of Habibullah* (1917–1930) created 6 working circles in the areas constituting the present Mettupalayam Range. Of these, 4 working circles, namely, Modur, Odanthurai East, Odanthurai West and Nellimalai were transferred to panchayat management in 1926–27. The method of treatment prescribed was ' coppice with standards ' on a rotation of 30 years, 25 standards being left per acre. As the growth in general was a poor scrub in most of the working circles, the system of working was changed to simple coppice under the orders of the Chief Conservator of Forests in 1920 (C.C.P. Forest Mis. No. 11, dated 9th January 1920).

207. The working plan prescribed an elaborate scheme for the eradication of prickly-pear and *Puchedi* in all the fuel working circles. The prickly-pear clearing operations have been described at some length, because so great was the importance attached to them by

McCarthy (the Conservator under whose the instructions the working plan was drawn up) and the Board of Revenue, that while only the order of felling without reference to dates was prescribed for the major operation of fuel felling, prickly-pear clearing was rigidly laid down for each year, irrespective of fuel working. Experience showed that the operation was not only costly but unsuccessful and the scheme was abandoned under the orders of the Chief Conservator of Forests in 1919, as the cost of eradication was found to be prohibitive.

208. Various silvicultural measures of improvement such as dibbling of sandal and *avaram* in the working coupes were carried out with indifferent results.

209. In the Nilgiri Eastern Slopes Reserved Forest there is no record of any organised fuel working having been done until 1925, when a provisional working scheme for three years was introduced. This scheme had a Fuel Working Circle over an area of 3,790 acres (1,533.77 hectares) which was divided into 30 annual coupes. The method of treatment prescribed as ' simple coppice ' with reservation of sandal, rosewood and tamarind.

210. In the *revised working scheme of H.R.M. Law*, the rotation was raised to 40 years, but this scheme not having met the Chief Conservator of Forests's sanction, it does not deserve any comment here.

211. The first organised working of the Velamundy Reserved Forest was done from 1914. A system of felling with ' coppice with standards ' was fixed. In 1916–17, the system was changed to ' simple coppice ' and again in the next year to ' simple coppice with belt ' and three species reserved.

212. *Hodgson's plan of* 1917 which was the first working plan for the Velamundy Reserve, prescribed a system of clear felling in the belts, but the Board of Revenue prescribed the adoption of the ' simple coppice ' system at the instance of the Conservator of Forests. Only sandalwood of 8 inches (20.32 centimetres) girth and above was to be reserved.

213. *Dupre Thornton's* 1921 working plan increased the rotation to 40 years with the same system of working as in the earlier plan.

214. The whole of the Velamundy Reserve was handed over to panchayat management in 1926–27.

215. *C. R. Ranganathan in his integrated working plan* for the Coimbatore North Forest Division (1932–1943) constituted a Fuel Working Circle which included practically all areas along the reserve margin on the foot hills where the growth is adequate and the terrain favourable for working. Four felling series, viz., Sundapatti, Jaccanare, Thattaipallam and Nilgiri Eastern Slopes were formed in the areas constituting the present Mettupalayam Range. The ' simple coppice ' system with a rotation of 40 years was prescribed with reservation of sandal, Tamarind, *Kadukkai* and Rosewood trees not required by the contractor were also prescribed to be felled with a view to reduce the increase of useless species in all worked areas. Artificial regeneration by the method of *rab* sowings with *kumri* in the worked coupes was prescribed. ' But the method had no sustained success as *rab* regeneration almost invariably disappeared after a few years ' (V. S. Krishnaswamy).

216. V. S. Krishnaswamy's plan (1943–1956) had little changes from Ranganathan's plan except for the fact that no artificial regeneration was prescribed in the felled coupes and the resultant coppice was expected to fill in the area. Added to this, it was specifically prescribed that only such growth as required by the contractor need be felled and the rest untouched. This was certainly a retrograde step as in the fuel forests of Mettupalayam Range, there is a general preponderance of useless species such as *Thanaku*, *Vandalai*, *Boothalai*, *Pachalai*, *Kalli*, *Mulkiluvai* and *Malankiluvai* over more useful ones. Retention of these species resulted in their increase and combined with the lack of artificial regeneration definitely resulted in a deterioration of the growing stock.

217. The only new feature in this plan was the creation of a reserve felling series in the Nilgiri Eastern Slopes Reserved Forest to meet the heavy demand for charcoal for producer gas vehicles during the war years. Since the war, petrol ceased to be the rare commodity it was and with the appearance of diesel oil on the scene, the demand for charcoal fell off.

218. V. S. Krishnaswamy also divided his fuel working circle into compartments and sub-compartments instead of the traditional 'coupes' with a view to have these areas as permanent divisions of the forests. One sub-compartment was prescribed to be sold every year.

219. V. S. Krishnaswamy also constituted a Fuel Plantation Working Circle in addition to his Fuel Working Circle. Under this working circle, one series was constituted in the Mettupalayam Range and *kumri* regeneration with *Chavukku* (*Casuarina equisetifolia*) wherever irrigation was possible and *Acacia* and *Albizzia* species were prescribed. The prescriptions appear to have been carried out during the first few years of the plan, but being not successful had to be subsequently abandoned.

220. *A. M. Mahmood Hussain in his revised working plan* (1956 to-date) constituted a Fuel Working Circle with only three felling series in the present Mettupalayam Range, viz., (i) Sundapatti series, (ii) Jaccanare series and (iii) Modur series, and one series, the Chennimalai series in the present Bhavani Range. The Modur and Chennimalai series were formed in the Modur and Chennimalai Reserved Forests' which were reverted to the Forest Department in 1951 on the abolition of the Forest Panchayats. In both these series no coupes are being currently worked due to paucity of growth. The Thattaipallam and Nilgiri Eastern Slopes series of the previous plans were deleted from working as direct communications leading to these areas were lost in the Bhavanisagar reservoir. The method of treatment prescribed was the same 'simple coppice' but the rotation was reduced to 30 years. The division into compartments and sub-compartments done in the previous plan were scrapped off. No artificial regeneration was prescribed as in the previous plan and the resultant coppice was expected to fill up the area. Although a definite condition was made insisting on the fuel coupe contractor to pollard and hack all useless species not required by him at about 4 feet (1.22 metres) from ground level in order to discourage coppicing, this seems to have been never implemented in practice.

E. Irrigated Teak Plantations.

221. The idea of irrigated teak planting in the Hulikaldurg Reserved Forest was set forth by C. R. Ranganathan in his chapter on Miscellaneous Regulations. Work on raising teak in the Hulikaldurg Reserved Forest under irrigation from the Coonoor river was started in 1932. An area of 2 acres (0.81 hectares) which was commanded by the irrigation channel passing through the reserve was selected and teak was raised by the *kumri* method. The attempt was a success. The experiment was repeated over adjoining areas in 1933 and 1934. Taungya planting was given up in 1935 as there was objection from the lower riparian land owners for the diversion of water for *kumri* crops. Teak planting was revised in 1936 but without the aid of field crops as permitted by the Collector of Coimbatore. An area of 2 to 3 acres (0.81 to 1.21 hectares) was regenerated annually. At the end of Ranganathan's plan period in March 1943, an area of 28.4 acres (11.49 hectares) had been raised with teak and 2 acres (0.81 hectares) under bamboos.

222. *V. S. Krishnaswamy in his revised plan* (1943 1956) included the areas thus regenerated under an Irrigated Plantations Working Circle. After detailed stock-mapping of the area he found that another 25 acres (10.11 hectares) was all that was available for further planting in the area. This he prescribed to be planted as early as possible subject to a minimum of 2.5 acres (1·01 hectares) per year.

223. Several experiments were conducted by the State Silviculturist to determine the best mode of irrigation and finally watering twice a week by percolation was adopted.

224. By 1949, all the available area of 55 acres (22.25 hectares) suitable for raising irrigated teak plantations in the Hulikaldurg Reserved Forest was planted up at an average cost of Rs. 24 per acre. Since 1952, casualties were found to occur in the older plantations with trees dying in groups, apparently because the soil and climatic factors were incapable of supporting a mature stand of teak which makes great demands by way of nutrition and water on the soil. It was therefore decided that the locality is suitable only for a short rotation teak crop meant for production of electric transmission and other poles. A rotation of 20 years was therefore arbitrarily fixed and the 1932 and 1933 plantations were clear-felled in 1954 and 1955 respectively although no felling was prescribed in Krishnaswamy's plan.

225. *Mahmood Hussain* included all the Hulikal plantations in a Teak Polie Working Circle. Fixing up a short rotation of 20 years for production of poles, he divided the entire area into 20 units or coupes so as to normalise the yield. The silvicultural system fixed was 'simple coppice' to be supplemented by artificial regeneration. Mahogany (*Swietenia macrophylla*) was prescribed to be underplanted in the understorey. Ordinary D grade thinnings at the ages of 7 and 13 years was prescribed. The fellings prescribed in the plan have been carried out regularly. At the time of writing this plan, the 1938 plantation has been clearfelled and poorly stocked patches in this area will be replaced during May 1962. The other prescriptions such as underplanting with mahogany have not been carried out.

226. From the experiences gained at Hulikal, it was considered that similar work could be successfully extended to other suitable areas. Accordingly further investigations were carried out by Mahmood Hussain under the directions of V. S. Krishnaswamy (the then Working Plan Conservator) in the area served by the Halur Halla stream, a tributary of the Bhavani. This stream which drains the Nilgiri Eastern Slopes was found to have a catchment area of about 23 square miles which receives an annual rainfall varying from 75 to 175 centimetres mainly from the north-east monsoon. Recorded measurements have shown that the lowest discharge recorded from the stream was 0.89 cusecs in August 1956 and the highest was 634 cusecs on 25th October 1957. It was concluded that the stream can be depended upon to provide enough water for raising irrigated teak over an area of 4,800 acres (1,538.51 hectares) in the Odanthorai Reserved Forest without curtailing the supply to the existing ayacut of 310 acres (125.45 hectares).

227. Unlike in the case of Hulikal, capital investment was found to be necessary to divert water from the Halur Halla to the plantation areas. The Government sanctioned the construction of an anicut across the stream and excavation of an irrigation channel to serve the plantation area in G.O. No. 3204, Food and Agriculture, dated 16th October 1957, at a cost of Rs. 1,24,300 to start with. This provided for the construction of a rough stone anicut connecting large sized stones and outcrops of rock in the bed of the stream, a temporary pipe sluice for diverting 10 cusecs of water and a channel taken along the upper contour for a length of about 8 miles (12.88 kilometres). The area of 4,800 acres (1,942.51 hectares) in the Odanthorai Reserved Forests proposed to be regenerated was brought under a separate Irrigated Teak Plantations Working Circle in Hussain's working plan. As the soil conditions in the locality are poor, it was expected that casualties mights occur beyond an age of twenty. The plantations were therefore considered suitable for production of poles only on a rotation of 20 years. With this basis, an area of 240 acres (97.12 hectares) was prescribed by Hussain to be cleared and planted up annually.

228. The construction of the dam and the main channel was taken up by the Public Works Department during 1957. The construction of the anicut and a portion of the main channel was completed within a year. Water was let into the channel for the first time on 13th October, 1958. The channel has been constructed up to a length of 3.10 miles (5 kilometres) to date. It is proposed to extend the channel as the planting work is extended. The total cost of the headworks and the main channel is expected to cost Rs. 2,40,000.

229. The first planting was done in the year 1958 when an area of 227 acres (91.86 heactares) was regenerated. During 1959, an area of over 200 acres (80.94 hectares) was planted up. From 1960 onwards, the annual planting area was reduced to 100 acres (40.47 hectares) annually due to various factors such as limitation of water-supply during the dry months, paucity of labour and accumulation of large areas for annual maintenance. A list of plantations raised up-to-date is given in Appendix IV. Teak has been primarily used for planting, but in places wherever teak has failed due to undulations in the terrain, other species such as *Chavukku*, *Eucalyputus* hybrid, Neem and Tamarind have been put in order to replace the casualties. Of these, *Eucalyptus* hybrid is doing remarkably well: seedlings one year old are even 6 feet (1.83 metres) high and appears to the best species wherever teak has failed.

230. Underplanting of teak with a suitable shrub crop for multiple land use of the soil as also to improve it in order to boost up the growth of teak was attempted with several species. *Kolukattai grass* (*Cenchrus ciliaris*) was the first to be tried. A small soil worked patch in the 1958 plantation was sown with *Kolukattai* grass seeds during

1959. The grass came up very well but it served as an invitation to elephants which started working havoc in the teak and therefore further sowing had to be rightly given up. Since 1961. *Daincha* (*Sesbania aculeata*), and since 1962, Camphor Tulsi (*Ocimum kilimandscharicum*) have been grown in small patches, the former for supplying seeds to ryots as part of the grow more food schemes and the latter for the indigeneous production of camphor. Both the species seem to do fairly well, but the work will have to be repeated for another couple of years before a definite opinion can be given.

231. The performance of teak in Odanthorai is not quite uniform. On gently sloping terrain where some soil is present, the growth is something remarkable and the height growth corresponds to All-India Site Quality I. On slightly elevated bits where irrigation water does not reach properly, swampy patches, or gravelly zones with little or no top soil, teak has a tendency to stagnate. The performance of the species therefore needs careful study so as to effect the necessary manipulations in the irrigation or preparation of the soil for obtaining uniformly good results.

F. Bamboos.

232. Bamboos occur only in the Mettupalayam Range. The chief species is *Kalmungil*, but *Perumungil* is confined to stream margins and swampy localities except in the Kallar and Hulikal reserves where it is found more extensively.

233. Before 1915, bamboos appear to have been worked on a felling cycle of 14 years, because of the lack of demand for the produce. In 1915, Panchapakesa Ayyar prepared a general working plan for the Mettupalayam Range which was however not approved and was revised in 1917 by Habibullah. In that working plan, provision was made for the systematic working of bamboo areas, but the plan which was subsequently prepared and sanctioned, altogether omitted the Bamboo Working Circle on account of the flowering of bamboos which was then taking place. Bamboo coupes were however worked regularly from 1920–21, more or less on the lines indicated by Panchapakesa Ayyar. Three fuel series, viz., Kallar, Jaccanare and Hulikal were formed which were worked on a five year felling cycle.

234. *Under V. S. Krishnaswamy's plan*, the distinction between commercial and village series was abolished and all the coupes were to be leased out in open auction. In addition to the existing 6 series, two more series, viz., Aduthorai and Burliar series were formed. The felling cycle continued to be 3 years.

235. *Under Mahmood Hussain's plan*, the 8 series of the previous plan were reorganised to form 4 series, viz., Uliyur, Jaccanare, Kallar and Hulikal.

236. The working of the bamboo coupes has been generally carried out as per programme in all the 3 plans. The results are the same as for bamboo working anywhere else in the state. " Ordinarily the contractor fells and removes all saleable culms and leaves the rest. Culms are often cut high, over 15 feet high (4.58 metres) sometimes The result is that a mass of dead stumps collect in the clump and effectively impede low cutting, so that high cutting becomes inevitable thereafter until the clump becomes badly congested. All these practices lead to rapid deterioration of the clumps. Penalties are occasionally imposed no doubt, but do not deter the lessees, accustomed to the general and long continued indifference of the staff to the enforcement of the felling rules " (Mahmood Hussain)

G. Minor Forest Produce.

237. The chief minor forest products are honey, wax, deer horns, *shekoy*, tamarind, gall nuts, fodder grass, palmyrah leaves, *avaram* and *konnai* bark. Honey, wax and deer horns and the valuable remains of dead animals have been collected departmentally for quite a long time. For the last four years, honey and wax are sent to the Forest Utilisation Officer, Madras who is in charge of the sale of these produce. Since the introduction

of regular working plans, the right of collection of each of the other items (except *Konnai* bark) either singly or in groups is sold annually in open auction.

Konnai bark is leased out once in five years.

H. Grazing.

238. From the time of reservation, all the forests of the region were opened to grazing subject to payment of the prescribed fees. The grazing fees were fixed at 4 annas per cow, 8 annas per buffalo and 2 annas per sheep in the forests of the present Bhavani Range. In the Mettupalayam Range, the grazing fee per cow unit was 3 annas. The fee for a penning licence was Re. 1 per 100 heads of cattle or less. Irulars resident in the Mettupalayam Range were allowed to graze free ,subject to a limit fixed by the District Forest Officer for each settlement. The grazing year was from 1st April to 31st March. From 1911-12, this was changed so as to be from 1st July to 30th June and has since then been so.

239. The grazing fees underwent a series of changes until the present rates of grazing fees were prescribed in 1938. Fee for penning licences has been abolished recently.

240. *C. R. Ranganathan* (1932–1943) prescribed the complete closure to grazing of the entire Fuel Working Circle and areas regenerated. This was a very unfortunate prescription as it meant the denial to the cattle their most frequented grazing grounds. The prescription could not be given effect to on account of popular clamour and the prescription itself was amended in 1935, and the closure restricted to a period of 5 years including the year of felling.

241. *V. S. Krishnaswamy* (1943-1956) prescribed the introduction of deferred and rotational grazing. When worked fuel coupes were thrown open to grazing, they were formed into rotational grazing blocks. " These prescriptions remained only nominally in force and practically became a dead letter during the later years of the plan due to lack of enthusiasm on the part of the public " (A. M. Mahmood Hussain).

242. *A. M. Mahmood Hussain* (1956 to date) did not prescribe anything else beyond routine closure of all worked coupes and regeneration areas to a period of five years including the year of operation.

I. Fire protection.

243. Fire protection of the reserves as a systematic annual operation appears to have been commenced in 1895. The method adopted was to fire trace a network of fire lines, the more frequented foot-paths and roads being selected as fire lines.

244. Early burning as a measure of fire protection was introduced in 1919.

245. *C. R. Ranganathan* (1932-1943) prescription the continuance of fire tracing of foot-paths and roads as a measure of fire protection, but discontinued early burning as being wasteful. He also prescribed the closure of areas burnt to grazing and grass-cutting as a punitive measure.

246. There were no changes in the prescriptions in the subsequent plans of *V. S. Krishnaswamy* (1943 to 1956) and *Mahmood Hussain* (1956 to date) except that fire tracing of lines was discontinued later under orders of the Chief Conservator of Forests.

J. Ex-Panchayat Forests.

247. The details of working of the Nellimalai, Odanthorai, Modur, Pethikuttai, Velamundy, Voipadi, Kongampalayam, Arachalur, Sennimalai and Vellikaradu Reserved Forests up to their transfer to panchayat management in the year 1926–27 have been briefly given in the preceding paragraphs wherever such information is available. In this sub-section an attempt is made to detail the management of these forests during the panchayat regime and after their reversion to the Forest Department in 1951.

248. Very little information is available on the management of these forests under the panchayat regime. Even this is not of any scientific interest as the areas were indiscriminately felled and abused with overgrazing and browsing. With the singular exception of the Sennimalai Reserved Forest, all these forests were reverted back to the Forest Department in a hopelessly denuded condition.

249. Large-scale attempts at regenerating these areas were made soon after their reversion to the department. The majority of these of course ended in nothing but failure. The details of such work done are described separately in Section 3, as they were all carried outside working plan prescriptions.

250. *Mahmood Hussain's working plan* (1956 to date) laid down elaborate prescriptions to work and rehabilitate the ex-panchayat forests. In the Modur-Pethikuttai and Sennimalai-Vellikaradu Reserves, a fuel series each was opened. An Irrigated Teak Plantation Working Circle was constituted in the Odanthorai Reserved Forest with prescriptions to plant this area with teak under irrigation utilising the waters of the Halur Halla. The details of these prescriptions and the result of working are already given in the preceding paragraphs. The remaining ex-panchayat forests were constituted under a separate Rehabilitation Working Circle with elaborate prescriptions to restock these areas. These prescriptions are based on a scheme approved by the Chief Conservator of Forests for rehabilitation of all ex-panchayat forests in the state (*vide* Chief Conservator's Reference No. 29397/54 D2, dated 2nd November 1954 and amended in Chief Conservator's Reference No. 10588/56, E2, dated 11th September 1956).

251. The Nellimalai, Arachalur and portions of the Velamundy, Voipadi and Kongampalayam Reserves were prescribed a system of 'coppice regeneration. Three series, viz., (i) Nellimalai, (ii) Arachalur and (iii) Velamundy series with 15 'coppice' coupes in each series were constituted. The treatment prescribed was to sell one coupe every year so that coppicing of the existing live stmps followed by protection would improve the growing stock. In the areas thus included, 95 per cent of the stand consisted of a coppice growth of useless species such as *Mulkiluvai* and any recoppicing would have resulted in a further setback to the vegetation. Fortunately none of the prescriptions of this method was even put into effect.

252. The second method prescribed was 'kumri' regeneration' in suitable areas. Five series, namely, Velamundy East, Velamundy West, Velamundy Central, Vijayamangalam and Modur series were constituted. Each of the series was divided into ten blocks, and each block was prescribed to be tackled once in three years in a sequence noted in the plan. Cashew was prescribed to be planted with *kumri* regeneration. An area of 202 acres (81.75 hectares) in the Velamundy Reserved Forest and 16 acres (6.48 hectares) in the Kongampalayam Reserved Forest was taken up during the first year of the plan (1956-57). During 1957-58, 1958-59 and 1959-60, areas of 300, 289.50 and 300 acres (121.41, 119.89 and 121.41 hectares) respectively were taken up annually in the Velamundy Reserve forest. All the plantations raised proved to be failures as the locality proved be thoroughly unsuited to the species. Further planting was therefore discontinued.

253. The third method prescribed was the 'Tractor ploughing' method. Two series, viz., (1) Velamundy and (2) Kongampalayam were constituted. The Velamundy series was divided into 15 blocks, whereas the Kongampalayam series consisted of a solitary block of 17 acres (6.88 hectares) in all. Tractor ploughing of the area followed by planting with cashew and a host of other miscellaneous species was prescribed. None of the prescriptions of this method were ever carried out during any of the years.

254. The fourth and fifth treatments prescribed were the 'sunken mound' and 'trench and mound' methods. One series was constituted under each of these two methods and this included portions of the Kongampalayam, Voipadi and Velamundy Reserves. The series was divided into 15 annual blocks to be regenerated at the rate of one annually with miscellaneous fuel species. The 'sunken mound' treatment was prescribed to areas in the plains and foot hill portions where tractor ploughing will not be possible, and the 'trench and mound' method to areas falling on hill slopes. According to these prescriptions, only Block I under the 'sunken mound' series comprising of 55 acres (22.25 hectares) in the Kongampalayam Reserved Forest was planted up and that too in the year 1958–59. As the results proved to be unsuccessful, further planting was given up.

255. It will be therefore seen that the prescriptions of Hussain's Rehabilitation Working Circle were deviated right from the beginning of the plan period and some of the prescriptions never put into operation even once. At the time of writing this plan, not one of the prescriptions of this working circle are in vogue.

SECTION 3—SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN.

256. *Conservators' plots.*—Soon after the ex-panchayat forests were reverted back to the department, large scale attempts at concentrated regeneration of fuel species to restock these areas were made during the years 1953, 1954 and 1955. These efforts which were largely centred in the Velamundy Reserved Forest showed 'spectacular initial success in some cases', but 'no lasting results could be achieved and the regeneration areas are almost all dismal failures. These plots were called Conservators' plots', (Mahmood Hussain).

257. *Grass and fodder plots.*—Under the Five-Year Plan Scheme, "Reclamation of eroded areas for fodder and pasture", a number of small grass and fodder plots have been raised year after year in the ex-panchayat forests of Bhavani range. In all these cases the area selected was ploughed and seeds of *Kolukattai* grass sown during the rains. A few Neem stumps have been put at intervals within the plot. Both the grass and the Neem have come up exceedingly well. The 1959 grass plot in Kongampalayam Reserved Forest (52 acres or 21.54 hectares), the 1959 and 1960 grass plots in Velamundy Reserved Forests of 2 acres (0.81 hectares) and 32 acres (12.95 hectares) respectively, and the 1961 grass plot (50 acres or 20.23 hectares) in Sennimalai Reserved Forest are some of the areas where outstanding results have been achieved. A 150 acre (60.70 hectares) fodder plot in Voipadi and another plot of 90 acres (36.42 hectares) in Arachalur Reserved Forest raised during 1951 and 1960 respectively have not come up well. In these two plots ploughing and sowing of grass seeds were not done, and the work was confined to planting of fodder tree species in pits or saucers.

258. *Soil Conservation in low hill areas.*—This is a Five-Year Plan Scheme and the work involved was planting of fuel species in degraded areas subjected to various forms of erosion. An area of 54 acres (21.85 hectares) was regenerated with indigenous fuel species in a felled fuel coupe (Chennimalai F.C. 1) in the Vellikaradu Reserved Forest. Similar work over an area of 27 acres (10.92 hectares) was carried out in the Vellikaradu Reserved Forest during 1960–61 in Chennimalai F.C. IV, and the area of 40 acres in F.C. VI during 1961–62. The technique followed was planting pot plants of fuel species in pits 1 foot (.31 metre) cube or along sunken mounds 6 feet (1.83 metres) or 11 feet (3.35 metres) long at varying espacement. None of these attempts have been successful. During 1961-62, in an area of 37 acres (14.97 hectares) in the Sennimalai Reserved Forest (in Chennimalai F.C. VI), line sowings of indigenous fuel species such as Neem, *Parambai*, *Velvelam*, Tamarind, etc., was done along the contour 33 feet (10.06 metres) apart.

259. Soil conservation work on slightly different lines was done elsewhere in the Bhavani Range also. An area of 144 acres (58.28 hectares) in the Velamundy Reserved Forest was planted during 1958 with seedlings of *Usil*, *Sissoo* (*Dalbergia sissoo*), *Velvelam*, *Neem*, *Velvagai*, etc., in 1 foot (.31 metre) cube pits at an espacement of 33 feet by 16 feet (10.06 by 5.03 metres). Practically all the species having failed, the casualties have been replaced with Neem stumps at random. The Neem has come up very well but the stocking is not sufficient.

260. Similar work is said to have done in the Mettupalayam Range also, but details of work done are not available. There is no evidence of any successful results having been achieved either.

261. *Daincha plots.*—An area of 15 acres (6.07 hectares) was ploughed and got ready in the 1958 failed cashew Regeneration Area in the Velamundy Reserved Forest of Bhavani Range for sowing with *Daincha* seeds. Due to non-receipt of sufficient seeds only an area of 5 acres (2.02 hectares) could be sown. A good harvest of *Daincha* seeds was collected, but the work was not continued further for reasons not known.

262. *Irrigated teak plots in Thattaipallam.*—To meet the growing demand for timber in the state, it was suggested to undertake large-scale planing of teak under the Second Five-Year Plan. Accordingly it was decided to plant teak under the irrigated method both at Odanthorai Reserved near Halur halla and in the Nilgiri Eastern Slopes Reserved Forest in Koothamundi beat near the Thattaipallam making use of the perennial supply of water from these two streams. The details of the planting at Odanthorai have already been discussed in detail in the preceding section. Two plantations were raised outside working plan prescriptions during 1956 and 1957 in the Nilgiri Eastern slopes Reserved Forest utilising the waters of the Thattaipallam. The results are discussed below.

263. 1956 *Regeneration Area.*—The area taken up for this purpose is 50 acres (20.25 hectares) but for want of teak stumps only 14 acres (5.67 hectares) at an espacement of $8\frac{1}{2}$ feet by $8\frac{1}{2}$ feet (2.59 by 2.59 metres) were planted. These were being irrigated till last year with water diverted from the Thattaipallam.

264. 1957 *Regeneration Area.*—Area of this plot is 20 acres (8.09 hectares). The espacement adopted is $8\frac{1}{2}$ feet by $8\frac{1}{2}$ feet (2.59 by 2.59 metres). The plot is being watered regularly from 20.11.1957.

265. Both the plantations are not quite successful as water is not available for irrigation during the summer months. Hence further planting in the Thattaipallam Valley was given up.

266. *Roads, buildings and wells.*—Three separate statements are appended below exhibiting separately the roads, bridle paths and wells in the region, with their capital costs, year of construction, the average cost of annual repairs and other connected information.

List of roads and bridlepaths

Serial number and name of the road or path.	*Length in* M.	F.	*(Kilometres).*	*Year of construction.*	*Cost of construction.* RS. P.	*Average annual cost of maintenance.* RS. P.
(1)	(2)		(3)	(4)	(5)	(6)
(a) Mettupalayam Range.						
1 Kilkotagiri road	5	6	(9·254)	Transferred from the District Board in 1911.	1,200 00	2,978 74
2 Halur Dam site road ..	2	1	(3·420)	1957–58.	5,191 00	335 14
3 Approach road to Kunjapanai Rest House.	0	1	(0·201)	Not known.	Not known.	Not being maintained.
4 Approach road to Hulikal Teak plantations.	0	2	(0·402)	Do.	No expenditure was incurred as the road was formed by contractors.	Do.
(b) Bhavani Range.						
Nil.						

List of Buildings—

Serial number and name of the building.	*Year of construction.*	*Cost of construction.* RS. P.	*Average annual cost of maintenance for five years ending 1961–62.* RS. P.
(1)	(2)	(3)	(4)
(a) Mettupalayam Range.			
1 Rest House and Out house at Kunjapanai ..	1917–18	6,326·50	20·00
2 Inspection Shed at Niralai	1927–28	620·00	..
3 Tanah Shed at Mettupalayam	1914–15	222·00	10·00
4 Odanthorai Reserve Watcher's quarters ..	1957–58	2,672·60	5·00
5 Forest Guard's quarters at Odanthorai	1958–59	2,665·67	10·00

Serial number and name of the building.	*Year of construction.*	*Cost of construction.*	*Average annual cost of maintenance for five years ending 1961-62.*
(1)	(2)	(3)	(4)
		RS. P.	RS. P.
(a) *Mettupalayam Range*—cont.			
6 Kunjapanai Watcher's quarters	1958-59	..	10·00
7 Assistant Range Officer's shed at Odanthorai ..	1959-60	1,034·00	15·00
8 Odanthorai Motor lorry garage	1959-60	281·11	5·00
9 Forest Guard's and Watcher's combined quarters at Odanthorai.	1961-62	5,416·50	10·00
10 Forest Guard's and Watcher's combined quarters as Nellithorai.	1961-62	5,569·37	10·00
11 Three mazdoors' lines at Odanthorai	1961-62	9,100·00	15·00
(b) *Bhavani Range.*			
1 Forest Guard's and Watcher's quarters for Velamundy East beat.	1959-60	5,806·00	10·00
2 Forest Guard's and Watcher's quarters for Velamundy West beat.	1960-61	6,312·00	10·00

List of wells.

(a) *Mettupalayam Range.*

Serial number, name and location.	*Cost of Construction.*	*Average annual cost of maintenance for five years ending 1961-62.*	*Remarks.*
(1)	(2)	(3)	(4)
1 Pethikuttai beat ..	Not known as the construction was done by the Pethikuttai Panchayat.	No repairs have been done since the Reserved Forest reverted to the department.	The wells were dug during the panchayat regime. No repairs were effected by the department since they were taken over.
2 Do. ..	Do. ..	Do.	Do.
3 Do. ..	Do. ..	Do.	Do.
4 Do. ..	Do. ..	Do.	Do.
5 Do. ..	Do. ..	Do.	Do.
(b) *Bhavani Range.*			
1 Velamundy East beat (4 wells).	Constructed by the Velamundy Panchayat.	131·00	Wells dug during the Panchayat regime and these were deepened by the Department in 1959-60.
2 Velamundy West beat (6 wells).	Do.	198·00	Wells dug during the Panchayat regime and these were deepened by the Department in 1959-60 and 1960-61.
3 Volpadi beat ..	Do. ..	Nil.	Wells dug during the Panchayat regime. No repairs were done since their reversion to the Forest Department.
4 Arachalur beat (2 wells).	Do. ..	240·00	Wells dug during the Panchayat regime and these were deepened by the Department in 1958-59.

List of Rain Gauges.

Serial number, name and location.	*Year of construction.*	*Cost of construction.*	*Annual average cost of maintenance for five years ending 1961-62.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)
1 Rain guage at Niralai Inspection shed.	Not known.	Not known.	Not maintained.	This has been abandoned and so noparticulars are available.

SECTION 4—PAST YIELD.

267. The following statement exhibits the yield for the years 1956–57 to 1961–62. Figures prior to 1956 are not quoted as they are already covered by Mahmood Hussain's working plan.

Year.	Firewood billets in Tons.	Firewood billets in (Metric tonnes).	Faggotwood in headloads.	Bamboos in number Thattai.	Bamboos in number Nathi.
(1)	(2)	(3)	(4)	(5)	(6)
(a) Mettupalayam Range.					
1956–57	934·75	(949·753)	....	930	2,28,797
1957–58	No sale.		....	4,102	6,010
1958–59	2,298·00	(2,334·883)	....	1,081	9,758
1959–60	616·50	(626·395)	....	..	5,833
1960–61	1,030·00	(1,046·531)	....	3,575	12,390
1961–62	4,698·00	(4,773·403)	....	6,733	6,658
(b) Bhavani Range.					
1956–57	165·00	(167·648)	....	..	..
1957–58	No sale.		....	..	..
1958–59	No sale.		....	..	..
1959–60	113·00	(148·814)	1,644 headloads of thorns.	..	..
1960–61	67·00	(68·075)	48 cartloads of thorns and 102 headloads of thorns.	..	..
1961–62	75·00	(76·204)	....	..	..

Year.	Bamboos in number Vedar.	Bamboos in number Aruvatheri.	Bamboos in number Othavu.	Bamboos in number Karanai.	Splits in bundles.
	(7)	(8)	(9)	(10)	(11)
(a) Mettupalayam Range—cont.					
1956–57	36,718	30,105	3,800	..	..
1957–58	15,088	14,533	550	400	..
1958–59	19,446	35,232	4.470	1,840	96
1959–60	16,848	16,660	..	..	980
1960–61	76,575	32,725	..	..	3.800
1961–62	34.659	33,353	..	..	..
(b) Bhavani Range—cont.					
1956–57	..	..	..	..	..
1957–58	..	..	..	..	..
1958–59	..	..	..	..	..
1959–60	..	..	..	..	..
1960–61	..	..	..	..	..
1961–62	..	..	..	..	..

268. The yield from minor forest produce is given below :—

Year.	Gall nuts. Tons.	Gall nuts. Quarters.	Gall nuts. (Metric tonnes).	Konnai bark. Tons.	Konnai bark. Quarters.	Konnai bark. (Metric tonnes).	Avaram bark. Tons.	Avaram bark. Quarters.	Avaram bark. (Metric tonnes).
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(a) Mettupalayam Range.									
1956–57	..	..	..	..	..	..	11	21	(11·444)
1957–58	0	75	(0·975)	..	..	..	12	61	(12·967)
1958–59	..	..	..	..	..	..	13	20	(13·463)
1959–60	31	10	(31·625)	..	..	..	7	19	(7·353)
1960–61	2	21	(2·299)	4	40	(4·572)	4	00	(4,064)
1961–62	0	41	(0·521)	..	..	..	..	..	..

Year.	Gall nuts. Tons.	Gall nuts. Quarters.	Gall nuts. (Metric tonnes).	Konnai bark. Tons.	Konnai bark. Quarters.	Konnai bark. (Metric tonnes).	Avaram bark. Tons.	Avaram bark. Quarters.	Avaram bark. (Metric tonnes).
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
				(b) *Bhavani Range.*					
1956–57	..	..	..	..	..	..	8	65	(8·957)
1957–58	..	..	..	..	..	..	8	65	(8·957)
1958–59	..	..	..	..	..	..	9	00	(9·144)
1959–60	..	..	..	..	..	..	3	65	(3·873)
1960–61	..	..	..	..	..	..	..	..	..
1961–62	..	..	..	..	..	..	..	..	..

Year.	Tamarind. Tons.	Tamarind. Quarters.	Tamarind. (Metric tonnes).	Shekoy. Tons.	Shekoy. Quarters.	Shekoy. (Metric tonnes).	Poochakottai. Tons.	Poochakottai. Quarters.	Poochakottai. (Metric tonnes).	Minor forest produce.
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
										BUNDLES.
				(a) *Mettupalayam Range*—cont.						
1956–57	4	50	(4·699)	..	..	..	..	..	..	..
1957–58	1	00	(1·013)	1	27	(1·358)	1	45	(1·587)	453
1958–59	1	0	(1·908)	0	40	(0·508)	..	..	..	76
1959–60	..	..	..		65	(6·921)	10	70	(11·049)	30
1960–61	29	7	(30·354)	4	35	(4·508)	10	70	(11·049)	135
1961–62	..	..	..	3	44	(3·606)	..	..	..	..
				(b) *Bhavani Range*—cont.						
1956–57	..	..	..	..	..	..	..	..	..	..
1957–58	..	..	..	..	..	..	..	..	..	..
1958–59	..	..	..	..	..	..	..	..	..	..
1959–60	..	..	..	..	..	..	..	..	..	..
1960–61	..	..	..	..	..	..	..	..	..	..
1961–62	..	..	..	..	..	..	..	..	..	..

SECTION 5—PAST REVENUE AND EXPENDITURE.

269. *Revenue.*—The following statement exhibits the net revenue from various items of forest produce :—

Year. (1)	*By sale of fuel coupes.* (2) RS. P.	*By sale of bamboo coupes.* (3) RS. P.	*Proportionate revenue from sandalwood sales at Satyamangalam Depot.* (4) RS. P.	*By sale of minor forest produce.* (5) RS. P.	*Grazing revenue.* (6) RS. P.	*Other sources.* (7) RS. P.	*Total revenue* (8) RS. P.
		(a) *Mettupalayam Range.*					
1956–57	12,511·00	22,581·00	1,201·00	5,665·00	5,489·00	3,279·00	50,726·00
1957–58	No sale.	7,561·00	2,440·00	6,967·00	500·41	3,092·00	20,560·41
1958–59	21,857·00	5,515·00	14,196·00	7,448·00	3,759·25	6,357·00	59,132·25
1959–60	21,070·00	10,001·00	15,896·00	7,458·00	4,334·29	3,638·00	62,397·29
1960–61	34,112·00	9,757·00	35,130·00	7,649·00	814·88	796·50	88,259·38
1961–62	72,943·00	34,000·00	2,37,792·00	3,801·00	2,164·45	312·50	3,51,012·45
		(b) *Bhavani Range.*					
1956–57	Figures for this year are not quoted as they include for the present Andhiyur Range of Coimbatore North Division also.						
1957–58	No sale.	..	..	805·00	2,629·65	403·56	3,837·61
1958–59	No sale.	..	..	1,408·00	2,783·29	696·58	4,887·87
1959–60	1,413·00	..	..	955·00	2,690·43	674·65	3,320·08
1960–61	3,281·00	..	..	877·00	2,462·10	994·11	4,333·22
1961–62	No sale.	..	..	1,001·00	2,422·32	565·00	3,908·31

270. *Expenditure.*—The following statement exhibits the expenditure incurred during the period 1956–57 to 1961–62 :—

Year. (1)	*Roads.* (2 RS. P.	*Buildings.* (3) RS. P.	*Regeneration.* (4) RS. P.	*Establishment.* (5) RS. P.	*Miscellaneous.* (6) RS. P.	*Sandal extraction.* (7) RS. P.	*Total expenditure.* (8) RS. P.
		(a) *Mettupalayam Range.*					
1956–57	..	208·00	..	19,100·05	6,032·62	2,108·19	27,448·81
1957–58	1,132·31	163·00	1,215·84	24,282·47	8,723·15	9,930·50	45,447·27
1958–59	4,164·24	2,065·71	9,005·08	26,522·87	832·94	33,642·80	70,733·64
1959–60	4,317·20	26·00	1,521·55	32,720·80	2,600·85	1,897·80	43,084·25
1960–61	4,551·00	312·13	76,159·39	39,476·97	3,381·08	3,253·66	1,26,734·73
1961–62	7,398·00	20,086·78	53,993·25	6,734·42	3,004·25	1,282·14	92,498·84

(b) *Bhavani Range.*

1956–57	Figures for this year are not quoted as they include for the present Andhiyur Range of Coimbatore North Division also.						
1957–58	..	..	1,283·05	15,355·00	212·98	..	16,851.02
1958–59	..	..	2,908·40	26,944·74	457·00	..	30,310.14
1959–60	..	5,806·00	2,262·83	33,407·27	357·34	..	41,833·44
1960–61	..	6,312·00	2,018·29	23,373·61	475·97	..	32,197.81
1961–62	..	—	5,813·91	16,441·45	2,048.42	..	24,303·78

271. The following statement shows the net surplus or deficit in the region during the period 1956–57 to 1961–62 :—

Year.	Total revenue.	Total expenditure.	Surplus.	Deficit.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
	RS. P.	RS. P.	RS. P.	RS. P.	
		(a) *Mettupalayam Range.*			
1956–57	50,726·00	27,448·81	22,827·19	..	....
1957–58	20,560.41	45,447·27	..	24,886·86	....
1958–59	59,132·25	70,733·64	..	11,601·39	....
1959–60	62,397·29	43,084·25	19,313·04	..	....
1960–61	88,259·38	1,26,734·73	..	38,475·35	....
1961–62	3,51,012·45	92,498·84	2,58,513·61	..	....
		(b) *Bhavani Range.*			
1957–58	3,837·61	16,851·03	..	13,013·42	....
1958–59	4,887·87	30,310·14	..	25,422·27	....
1959–60	3,320·08	41,833·44	..	38,563·36	....
1960–61	4,333·21	32,197·87	..	27,864·66	....
1961–62	3,988·32	24,303·78	..	20,315·46	....

CHAPTER VI.—STATISTICS OF GROWTH AND YIELD.

SECTION 1—STATISTICS RELATING TO SANDAL.

272. *Sandal outturn.*—The following is a classified abstract of the trees extracted and the outturn of rough-cleaned wood realised from the two felling series in the Mettupalayam Range during a period of ten years from 1952–53 to 1961–62. These figures were compiled from the control book and the yield registers maintained for the Reserve Sandal Working Circle. Unfortunately, no such records were maintained for the Village Sandal Working Circle.

Name of felling series.	*Number of coupe.*	*Area in*		*Number of trees marked.*	*Number of sapwood trees.*	*Total quantity of rough cleaned wood obtained in*				
		Acres.	*Hectares.*			*Qrs.*	*Lbs.*	*Ozs.*	*[Quintals.*	*Kilograms.]*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1952–53—										
Halur	III	107	(43·30)	544	..	592	12	10	(75	24)
Manar	III	203	(82·15)	278	..	207	22	0	(26	39)
1953–54—										
Halur	IV	6,665	(2,697·25)	147	117	327	2	0	(41	53)
Manar	IV	774	(313·23)	295	..	203	14	0	(25	85)
1954–55—										
Halur	V	483	(195·46)	427	1	533	16	8	(67	77)
Manar	V	3,946	(1,396·90)	325	..	562	11	8	(71	43)
1955–56—										
Halur	VI	1,041	(421·27)	593	..	844	2	0	(107	19)
Manar	VI*	1,227	(496·55)	Particulars not available.		250	7	8	(31	79)
1956–57—										
Halur	I	3,149	(1,273·86)	Particulars not available.		..	..	..	..	
Manar	I	234	(94·70)	73	..	29	13	0	(3	76)
1957–58—										
Halur	I	3,197	(1,293·79)	Particulars not available.		..	..	..	..	
Manar	II	883	(357·33)	241	6	57	21	0	(7	33)
1958–59—										
Halur	III	107	(43·30)	349	..	233	17	0	(29	67)
Manar	III	203	(92·15)	332	24	230	6	0	(29	24)

1959–60—										
Halur	IV	6,665	(2,697·25)	792	..	844	22	0	(107	..)
	IV	(Same coupe worked again during the year).		8,557	96	7,770	19	0	(986	92)
Manar	IV	774	(313·23)	199	...	222	16	3	(28	27)
1960–61—										
Halur	V	483	(195·46)	1,920	..	1,343	12	0	(170	62)
Manar	V	3,946	(1,596·90)	182	..	401	24	8	(51	04)
1961–62—										
Halur	VI	1,041	(421·28)	1,313		549	16	8	(69	89)
Manar	VI	1,187	(480·36)	1,139	73	1,947	0	0	(247	28)

NOTE.—* Includes trees marked and extracted in sub-coupes VI (c) and VI (d) which lie in Perianaickenpalayam Range.

273 The extreme variability in yield in the past which the above statement indicates is likely to continue in the future also as the yield is dependant on the mortality of sandal.

274. *Enumeration of sandal.*—No enumeration of sandal in the Mettupalayam Range was done during the preparation of any of the previous plans. As the Chief Conservator's instructions were that the writer should merely separate Mahmood Hussan's prescriptions for Mettupalayam and Bhavani Ranges for this plan from the latter's integrated plan for Coimbatore North Forest Division, without effecting any changes (unless they are now not being implemented or have been modified), it was considered not necessary to do a fresh enumeration during the present compilation. The time given to the writer for this compilation work also being short, it was considered not worthwhile to do any sandal enumeration at present. Judging from the fact that the yield from sandal has been so variable in the past, dependant as it is upon the mortality of trees due to the spike disease, the enumeration figures even if available, would not have been of any use in forecasting the future yield. This apart, it has to be however admitted that the enumeration figures if available would have given us an idea of the composition of the existing growing stock.

SECTION 2—STATISTICS RELATING TO IRRIGATED TEAK PLANTATIONS.

275. *Hulikal plantations.*—Mahmood Hussain took measurements of average girth at breast height and average height of daminants in each plantation in the Hulikal teak plantations, and compared these figures with the data in the All-India Yield and Standard Tables for Teak by M. V. Laurie and Bakshi Sant Ram (*vide* paragraph 315 of Hussain's plan). As Laurie's yield tables (which is largely based on Burmese data) has now been superseded by the new All-India Yield and Standard Tables for teak prepared recently by the Forest Research Institute, Dehra Dun, it was decided to compare the above figures with that in the new yield tables.

276. The following statement shows the average girth at breast height and height measurements of dominants in each plantation as well as the site, quality, class, assessment for each plantation according to the revised tables. These figures are based on measurements made by Hussain in November 1954. As the plantations are worked on a rotation of 20 years, it was considered not necessary to take fresh measurements during the present compilation. Although some of the plantations have been felled since the measurements were taken, the data can give us an idea of the possibilities the site is capable of.

Year of formation.	Age when the measurements were taken.	Average girth at breast height of dominants.		Average height of dominants.			All India Site Quality Class.		Remarks.
		INCHES.	(CENTIMETRES).	FEET.	INCHES.	(METRES.)			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)
1932	22	38	(96.52)	58	6	(17·83)	0·18	II	Clear-felled in 1954 and patch regeneration done in 1955.
Lower half of 1932 clear-felled in 1938.	16	25	(63·50)	56	6	(17·22)	0·93	II	
1933	21	24·8	(63·00)	55	8	(16·97)	0·94	II	Clear-felled in 1955 and patch regeneration done in 1957.
1934	20	31·5	(80·01)	61	5	(18·72)	0·80	II	Clear felled in 1958 and patch regeneration done in 1959.
1936	18	26·8	(68·07)	52	7	(16·03)	0·00	II	Clear-felled in 1959 and patch regeneration done in 1960.
1937	17	25·8	(65·53)	51	2	(17·60)	0·05	II	Clear-felled in 1960 and patch regeneration done in 1961.
1938	16	26	(66·04)	48	7	(14·81)	1·87	III	Clear-felled in 1961 and patch regeneration done in May 1962.
1939	15	27	(68·58)	49	3	(15·01)	0 16	II	
1940	14	22·8	(57·91)	46	0	(14·02)	1·73	III	
1942	12	23·5	(59·69)	46	5	(14·15)	0·53	II	
1943	11	23·5	(59·69)	46	5	(14·15)	1·00	II	
1944	10	15·3	(38·86)	32	5	(9·81)	1·08	III	
1945	9	18·8	(47.75)	29	11	(9·12)	..		
1946	8	17·8	(45·21)	40	9	(12·42)	..		
1947	8	17·8	(45·21)	40	9	(12·42)	..		
1948	6	19·2	(49·02)	44	8	(13·62)	..		
1949	5	18·8	(47·75)	40	8	(12·40)	..		

277. It is thus seen that the site quality varies from II to average III.

278. It would have been worthwhile to compare the girth measurements of the Hulikal plantations with that in the All-India Yield Tables for plantations of same age for similar site qualities, but unfortunately such a comparison was not possible as the new yield tables are said to be yet finalized, and only a cyclostyled copy of the approved tables showing the grouping of the heights according to the site quality classes were made available to the writer through the kind courtesy of the Head, Division of Forestry, Forest Research Institute, Dehra Dun.

279. *Odanthorai plantations.*—As the growth in the Odanthorai plantations in extremely variable, it was considered not desirable to work out the average site quality for each plantation on the basis of height measurements of a few dominants selected in each plantation as done for Hulikal. In plantations of large extent with extremely variable growth, the proper thing to do would be a detailed quality class stock-mapping of all the plantations (by the same method as adopted for the Bolampatti Range), but then since all the Odanthorai plantations are less than 10 years of age, the site quality would not have expressed itself and therefore any such qualitative work would be at present premature. The idea had to be therefore abandoned.

SECTION 3—STATISTICS RELATING TO FUEL FORESTS.

280. The fuel forests in the region were worked under the coppice systems in the past and it was therefore considered worthwhile if it could be possible to study the rate of growth of the coppice shoots. The existing coppice in the worked coupes lack homogeneity in growth owing to the varying rate of growth from place to place according to the nature of the soil and rainfall and the amount of freedom which the coppice shoots had enjoyed to grow amidst a mass climbers and shrubs. The task of therefore accurately computing the average rate of growth of the coppice shoots was therefore impossible and had to be abandoned. The failure of the coppice systems to adequately restock these forests and the necessity to rely more and more on artificial regeneration for the future also rule out the necessity of working out the rate of growth of coppice regeneration.

PART II

Future Management Discussed and Prescribed.

CHAPTER I—BASIS OF PROPOSALS.

SECTION 1—GENERAL OBJECTS OF MANAGEMENT.

281. The objects of management may be summarized as follows :—

(i) To conserve the forests of the region in the interests of soil conservation, water-supply and agriculture to the people in the plains;

(ii) to protect the forests against damage by man, fire and other harmful factors;

(iii) to exploit with due regard to silvicultural principles the resources of the forests in sandalwood, small timber, fuel, bamboos and minor forest produce with a view to meet the requrements of the local population to the extent possible;

(iv) to artificially rehabilitate with suitable indigenous and exotic fuel species, the ex-panchayat forests in the region which are now degraded;

(v) to enhance the value of the forest by tending the scanty sandal growing stock wherever necessary;

(vi) to provide grazing facilities to the villagers adjoining the forests consistent with the principles of forest conservancy;

(vii) to provide the domestic needs of the aboriginal tribes who depend on the forests for their livelihood and of the local population;

(viii) to improve the facilities for the accommodation of the subordinate staff of the region wherever necessary; and

(ix) generally to take all steps to attain the maximum financial return per acre of forest in perpetuity.

SECTION 2—METHODS OF TREATMENT TO BE ADOPTED.

282. The methods of treatment to be adopted varies with each of the working circles and are described in detail in the following chapters. Prescriptions and suggestions on matters not covered by the different working circles are indicated in the chapter on 'Miscellaneous Regulations'.

SECTION 3—WORKING CIRCLES, THEIR AREA AND DISTRIBUTION.

283. The realise the objects of management in view, the following working circles have been constituted. The following statement shows the distribution of the several working circles :—

Number and name of the working circle.	Area in acres.	Area in Hectares.
(1)	(2)	(3)
1 The Reserve Sandal Working Circle	21,899	(8,862·30)
2 The Fuel Working Circle	2,892	(1,170·36)
3 The Rehabilitation Working Circle	11,720	(4,762·96)
4 The Irrigated Teak Plantation Working Circle.	4,881·25.	(1,969·28)
5 The Bamboo Working Circle	16,425	(6,646·33)
6 The Minor Forest Produce Working Circle ..	All the reserves.	
7 The Grazing Working Circle	Do.	

SECTION 4—PERIOD OF THE WORKING PLAN.

284. This working plan will be in force for a period of ten years from 1st April, 1963 to 31st March, 1973. However, prescriptions to work the forests for another five years will be also made, so that there will be no break in the continuity of controlled working even if the revision of the working plan is not taken up in time.

CHAPTER II—WORKING PLAN FOR THE RESERVE SANDAL WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

285. *General constitution.*—This working circle includes all the sandal areas in the reserved forests of Mettupalayam Range. In the Bhavani Range, sandal does not occur except for a stray specimen seen here and there in the Velamundy forests and therefore do not merit inclusion in this working circle.

286. *Area.*—The total area of this working circle is 21,899 acres (8,862.30 hectares) of which the effective sandal area is 11,399.00 acres (4,613.06 hectares). An area of 10,500.00 acres (4,249.24 hectares) of non-sandal area has been therefore included in the working circle on account of the patchy distribution of sandal and the need for adopting natural features as boundaries.

287. *Character of the vegetation.*—Two types of forests are included in this working circle according to Champion's provisional classification—(1) 5a/CI Southern Cutch thorn forests, and (2) 4a/C2 South Indian dry deciduous forests (without teak). In both these types, sandal occurs as an associate species in varying proportions along with other fuel species. A detailed description of both the types is given in Chapter II of Part I.

SECTION 2—DIVISION OF THE AREA.

288. The area covered by this working circle has been divided into two felling series, particulars of which are furnished below :—

Serial number and name of the felling series.	*Area in acres (hectares.)*				*Boundaries.*	*Remarks.*
	Total.		*Effective.*			
(1)	(2)				(3)	(4)
1. Halur ..	14,642	(5,925·47)	7,342·00	(2,971·23)	Nilgiris Eastern slopes Reserved Forest (a portion); Jaccanare Slopes Reserved Forest; Sandalwood Reserved Forests I and II; Constantia Reserved Forest.	....
2. Manar ..	7,227	(2,924·64)	3,027·00	(1,224·99)	Kallar Reserved Forest and a portion of Hulikaldurg Reserved Forest.	In addition to the areas noted in Column 3, an area of 10,992 acres (4,432·16 hectares) in the Perianaicken-palayam Range is also included with-in the series.

289. The areas included under all the felling series have been shown on the management maps.

SECTION 3—ANALYSIS AND VALUATION OF THE CROP.

290. No enumeration of the sandal forests of the Mettupalayam Range were made for reasons mentioned in Chapter VI of Part I.

SECTION 4—METHOD OF TREATMENT.

291. *Silvicultural system.*—The silvicultural system followed will be the Natural Selection System '. According to this, only dead trees will be extracted. In addition, all trees broken by wind, elephants or any other cause will be felled and coppiced, or pollarded, according to whether the damage is caused to the stem or the crown, respectively. All such trees or parts of trees will be brought to stock in case they contain scented heartwood.

292. *Felling cycle.*—The current felling cycle of six years will continue. The territorial Conservator may however reduce the felling cycle in any felling series to three years if he is satisfied that the felling series is heavily spiked and that dead trees should be extracted quickly to avoid loss by fire or theft.

293. *Regulation of the yield and division into coupes.*—The present division of each felling series into six coupes has been retained intact. It is not claimed that they will be equi-productive as wide variations in yield have occurred in the out-turn from these coupes in the past. The yield being dependant on the mortality of sandal which is a very variable factor, any forecast of the yield or division of the coupes on an equi-productive basis is out of question. Ranganathan's hypothesis on the annual mortality rate and its proportion to the number of living trees in each girth class having been disproved (vide paragraph 191 of Chapter V of Part I), no ruling guide can be laid down to regulate the yield in the sandal forest subjected to spike where the extraction is confined to dead trees only. The division of each felling series into coupes is therefore done only to regulate the working and not as an attempt to regulate the yield.

SECTION 5—METHOD OF EXECUTING FELLINGS.

294. *Regulation of working.*—The working will be regulated by area. One coupe will be worked each year in each series.

295. *Agency of exploitation.*—All operations connected with the exploitation of sandal will be carried out departmentally as the species is extremely valuable.

296. *Felling rules.*—Only dead trees and damaged stems or parts containing scented heartwood with girth of 3 inches (7.6 centimetres) in girth need not be marked, felled or uprooted. All fallen branches and stems of sandalwood above 3 inches (7.6 centimeteres) in girth from the butt end lying in the coupe at the time of exploitation will also be collected. Marking, uprooting and extraction will be carried out according to the official pamphlet entitled 'Rules regarding selection, felling, cleaning, classification and disposal of sandalwood, and the method of maintaining depot accounts and other registers'.

297. All trees uprooted in the coupe during the day will be transported to the forest depot where it will be rough cleaned and stored until extraction is completed. The rough cleaned wood will be tied securely and transported to the Sayamangalam sandalwood depot in Coimbatore North Forest Division for sale in accordance with the existing practice. The revenue realized in the Coimbatore North Forest Division by the sale of sandalwood sent from the Mettupalayam Range will be credited to the revenues of the Coimbatore Central Forest Division.

SECTION 6—TABULAR STATEMENT OF FELLINGS.

298. The details regarding the coupes that have been constituted and their years of exploitation during the period of this plan are shown in the following statement.

299. Coupes which are to be worked during the succeeding five years are also indicated so that there may be no break in the continuity of controlled working in case the revision of this plan is not taken in time.

Year of working and name of felling series.	Coupe number.	Area of the coupe in acres (hectares). Total.		Effective.		Boundaries.
(1)	(2)	(3)				(4)
Halur .. 1968-69 1974-75	I ..	3,149	(1,273·86)	1,649·00	(667·33)	That portion of the Jaccanare Slopes Reserved Forest lying west of the Mettupalayam-Kunjapanai bridle path.
1963-64 1969-70 1975-76	II ..	3,197	(1,293·79)	1,547·00	(625·75)	That portion of the Jaccanare Slopes Reserved Forest lying east of the Mettupalayam Kunjapanai bridle path.
1964-65 1970-71 1976-77	III ..	107	(43·30)	67·00	(27·11)	Constantia Reserved Forest and Sandalwood Reserved Forests I and II.

Year of working and name of felling series.	Coupe number.	Area of the coupe in acres (hectares). Total.		Area of the coupe in acres (hectares). Effective.		Boundaries.
(1)	(2)	(3)				(4)
Halur 1965–66 1971–72 1977–78	IV ..	6,665	(2,697·25)	3,215·00	(1,301·07)	*North.*—The Athipallam; *East*—Eastern boundary of Nilgiris Eastern Slopes Reserved Forest; *South.*—Pudur-Velamundy Chatram footpath upto Peak Δ 2350 and thence a straight line southwest to Δ 2430 (Arasamokkal); thence the boundary runs westwards to a junction with Kullankaraipallam Peak Δ 1370); *West.*—Thence northwards along the branch stream of Kullankeraipallam to its junction with the Reserved Forest Boundary at Peak Δ 4323 Kulikarachamalai); and thence along the western boundary of the Nilgiris Eastern Slopes Reserved Forest to the starting point.
1966–67 1972–77	V ..	483	(195·46)	233·00	(94·29)	*North.*—An imaginary line joining Δ 4230 with Athipallam a point about 12 chains to the north of Marigudi temple; *East and South.*—The Athipallam; *West.*—Western boundary of Nilgiris Eastern slopes Reserved Forest.
1967–68 1973–74	VI ..	1,041	(421·28)	631·00	(255·35)	*North.*—Uppupallam and an imaginary line joining it with the Reserved Forest boundary; *East.*—The Athipallam; *South.*—An imaginary line joining Δ 4230 with Athipallam a point 12 chains to the north of the Marigudi temple; *West.*—Western boundary of Nilgiris Eastern slopes Reserved Forest.
Manar .. 1968–69 1974–75	I ..	234	(94·70)	124·00	(50·18)	*North.*— Melparli - Sinnamulli footpath; *East.*—The Manar river; *South.*—The Bhavani river; *West.*—The boundary runs along the eastern boundary of Berthorai enclosure and along Manjakombai-Mettupalayam road to a junction with Melparali Sinnamulli footpath.
1963–64 1969–70 1975–76	II ..	883	(357·33)	458·00	(185·35)	*North.*—Melparali-Sinnamulli footpath; *East.*—Thence along Manjakombai-Mettupalayam road and along the eastern boundary of Berthorai enclosure to a junction with Bhavani river; *South.*—Bhavani river; *West.*—Inter-state boundary between Madras and Kerala.
1964–65 1970–71 1976–77	III ..	203	(82·15)	103·00	(41·68)	*North and East.*—The Manar river; *south.*—Melparali-Sinna-Mulli footpath; *West.*—The inter-state boundary between Madras and Kerala.
1966–67 1972–73	IV ..	774	(313·23)	449·00	(181·70)	*North.*—An imaginary line joining Manjakombai footpath and the straight line southeastwards to a point on the common Reserved Forest boundary between Melur slopes Reserved Forest and

Year of working and name of felling series. (1)	*Coupe number.* (2)	*Area of the coupe in acres (hectares).* (3) *Total.*	*Effective.*	*Boundaries.* (4)
				Nellithorai Reserved Forest; thence along the above said reserved forest boundary to a junction with the Shappaguddapallam; *East*—The Shappaguddapallam; *South and West*.—The Manar river.
1966–67 1972–73	V ..	3,946 (1,596·90)	2,176·00 (870·61)	*North*.—The common reserved forest boundary between Melur slopes reservedforest andNellithorai reserved forest and a line runing northwards and north-eastwards to a junction with Mettupalayam Range boundary,and thence along the abovesaid range boundary to a junction with the Niralaipallam; *East*.—The Niralaipallam ; *South* —The Bhavani and Manar rivers ; *West*.—The Shappaguddapallam.
1967–68 1973–74	VI(*a*)	899 (363·81)	499·00 (201·94)	The Kallar Reserved Forest and Kallar Addition No. 1 Reserved Forest.
	VI(*b*)	288 (166·55)	158·00 (57·94)	*North*.—The Conoor River; *East and south*.—An imaginary line joining Nellithorai Reserved Forest with the old district boundary; *West*.—Old district boundary.

NOTE.—VI(*c*) } These two sub-coupes fall within the Perianaicken-
VI(*d*) } palayam Range.

SECTION 7—SUBSIDIARY SILVICULTURAL OPERATIONS.

300 *Tending*.—Tending of the sandal crop is a matter of the greatest importance. A regular tending is therefore prescribed. It is advantageous that tending is carried out simultaneously with the enumeration and marking of dead trees for extraction, as this would ensure economy in expenditure and also check-measurement of the work done. The tending cycle will therefore correspond with the felling cycle and will be done once in six years. The coupe under extraction will be tended each year.

301. *Nature of tending*.—Three factors are of importance to the growth of young sandal—lateral shade, overhead light and the presence of suitable host trees. In the case of older trees, as much light as possible should be given in order to assist crown development and consequent diameter increment, as the species tends to become a strong light demander. Bearing these points in mind, the following rules are laid down for the guidance of tending officers:—

(i) No tree or plant that serves or might serve as a host should be destroyed; when necessary, such growth should be coppiced or pollarded in order to relieve the sandal from suppression.

(ii) All climber growth should be cut.

(iii) In the case of seedling or sapling growth, all lateral shade should be preserved and only overhead light admitted in order to encourage height growth. All cut materials should be placed around the sandal saplings both to provide shade and to keep out browsers.

(iv) In the case of older trees, overhead shade should be removed.

302. *Artificial regeneration*.—Artificial regeneration of sandal is not prescribed as spike is endemic in the Mettupalayam Range although the incidence is not heavy. The question of raising a spike resistant strain and propagating it (as per the advice of Dr. Kristensen, the FAO Expert) has now been taken up by the State Silviculturist. The results of the investigation by the State Silviculturist may be therefore awaited before any artificial planting is initiated.

SECTION 8—OTHER REGULATIONS.

303. *Retail sale of sandalwood billets.*—The retail sale of sandalwood billets for bona-fide domestic use will be continued as hitherto. The Head Clerk of the District Forest Office and the Range Officers will be the salesmen and they will keep sufficient stock to meet the demand.

304. *Grazing.*—The entire working circle will be open to grazing.

305. *Fire protection.*—No. special methods of fire protection are prescribed for this working circle.

SECTION 9—CONTROL.

306. The following control records will be maintained by the District Forest Officer :—

(1) Control book.

(2) Record of works.

(3) Control journal.

(4) Control map.

307. The manner in which these records are to be maintained are indicated in Sections ' M ' and ' N ' under the chapter on Miscellaneous Regulations.

308. The control journal should make a special mention of the incidence of spike in the area.

CHAPTER III—WORKING PLAN FOR THE FUEL WORKING CIRCLE.

SECTION I—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

309. *Objects of management.*—The main object of this working circle is to ensure the sustained production of the maximum quantity of fuel which the forests included are capable of yielding and for which there is an assured demand primarily in the towns of Coimbatore, Karamadai, Mettupalayam and Punjai Puliampatti, and the villages adjoining the forests, and to some extent small timber for local use.

310. *General constitution.*—This working circle will include the deciduous lower slopes of the hills that can be exploited for fuel at a profit. It will include all the areas included in the Fuel Working Circle of Hussain's working plan excepting the Modur and Chennimalai Series which have been excluded due to paucity of saleable growth.

311. No fresh areas have been proposed for working.

312. *Area.*—The area of this working circle is 2,892.00 acres (1,170.36 hectares).

313. *Character of the vegetation.*—The entire area included in this working circle falls under Champion's provisional classification—Group 5a/C1 Southern Cutch thorn forests. The chief fuel species in this type of forest are *Unjal*, *Porasu*, *Velvelam*, *Parambai*, Neem, *Pyrai* and *Vakkanai*.

314. A detailed description of the forest type is given in Chapter II of Part I.

SECTION 2—DIVISION OF THE AREA.

315. The area covered by this working circle has been divided into two felling series, particulars of which are furnished below :—

Serial number and name of the felling series.	Area in Acres.	Area in Hectares.
(1)	(2)	(3)
(a) *Mettupalayam Range.*		
1 Sundapatti	1,682·00	660·69
2 Jaccanare	1,210·00	489·67
(b) *Bhavani Range.*	Nil.	

316. No fuel series are constituted in the Bhavani Range.

317. The areas included under all the felling series have been shown on the management maps.

SECTION 3—ANALYSIS AND VALUATION OF THE CROP

318. Detailed enumeration or valuation surveys of the fuel series were not done, as they were not considered necessary.

319. All the fuel series have been stockmapped ocularly so as to exhibit the probable outturn of firewood in tons per acre. Only such areas as are capable of yielding at least 2 tons (2.03 metric tonnes) of fuel per acre on exploitation are included in this working circle. The stock maps thus prepared have been appended to this plan.

SECTION 4—METHOD OF TREATMENT

320. *Silvicultural system.*—The silvicultural system followed will be the 'coppice with reserves' system supplemented by artificial regeneration. All growth within the annual coupe whether saleable or unsaleable will be cleared excepting Sandal, Tamarind, *Poochakottai*, *Kadukkai*, Neem, *Vilamaram* (*Feronia elephantum*), *Pungam* (*Pongamia pinnata*) *Iluppai* (*Madhuca lalifolia* and *Madhuca longifolia*) *and Ilavu* (*Salmalia malabarica*) which will be treated as reserved species. They shall not be felled when they occur inside the coupes in accordance with the present policy of the Government. The retention of these species is prescribed because they are not regular fuel-yielding species and their value as minor forest produce yielding trees is much greater than their fuel value.

321. Artificial regeneration in the felled coupes will be done over not less than one-third the area, as regeneration by coppice as well as by plants of seedling origin is very sparse, and clearly insufficient to re-stock the area. No particular attention will be paid to the existence of coppice growth at the time of artificial regeneration and the coupe systematically planted. When tending the planted crop, coppice growth of valuable species will be selectively retained.

322. *Choice of species.*—The forests included in this working circle are low rainfall tracts with an average annual precipitation of about 75 centimetres. The soil is mostly shallow being a bouldery loam, and hence better fuel species which can also yield some timber like for, e.g., *Vengai*, Teak and *Karuvagai* (*Albizzia odoratissima*) may not succeed. Neem, Tamarind, *Karuvelam*, *Kodaivelam* and *Velvagai* are species best suited under the conditions and are therefore prescribed.

323. It is also suggested that a species of *Eucalyptus* suitable for the locality may also be tried as they are fast grown and can yield quick returns. In order to determine as to which species of *Eucalyptus* is suitable for the Perianaickenpalayam Range of Coimbatore Central Division, the Chief Conservator of Forests, Madras, directed the working plan party to open an experimental plot in the range during 1960–61 (Chief Conservator of Forests' Reference No. 14948/61 H-1, dated 10th October 1961) and experiment with

Eucalyptus hybrid, *Ecalyptus rostrata and Eucalyptus tereticornis.* An experimental plot of 2.75 acres (1.11 hectares) was accordingly laid down by the working plan party in Mangarai of Perianaickenpalayam Range and planted during November 1961 with *Eucalyptus hybrid* and *Ecalyptus rostrata* obtained from Mettupalayam and Ootacamund. The locality factors here are almost similar to that in the fuel series of Mettupalayam Range. As nursery seedlings of *Eucalyptus tereticornis* were not readily available, this species could not be tried. The experimental plot and the plot files opened in this connection have been handed over to the District Forest Officer for further maintenance. Of the two species tried, *Eucalyptus rostrata* failed completely, the species being apparently unsuited to the tract. *Eucalyptus* hybrid on the contrary has shown remarkable results. There is at present 80 per cent stocking in the plot and the plants have put up an average height of 6 feet (1.83 metres) within six months. It was also found that even if naked seedlings are planted during rainy or cloudy weather after nipping off the lateral leaves, they establish well athough pot plants did better. The species appears to be suitable for the locality but the results need watching for another year until definite conclusions can be reached whether it can be tried on a large scale. In the latter event, it should be certainly referred over the slower grown indigenous species suggested for planting.

324. *Rotation.*—The rotation for any fuel forest should be theoretically fixed at the age of maximum volume production. Since accurate data to calculate the age at which the Mean Annual Increment culminates is not available, the rotation will have to be theoretically fixed. The rotation will be fixed at 30 years as in the past two working plans. It is considered that a rotation of more than 30 years is not necessary, as the forests included in this working circle contain only small sized fuel species.

325. *Regulation of the yield.*—The yield will be regulated by area. In each felling series, therefore, the size of the annual coupe is obtained by dividing the total area by the period of the rotation. In the layout of the annual coupe, natural features have been followed as far as possible.

326. *Numbering of coupes.*—In numbering the coupes, Coupe VII of Hussain's plan which is to be worked during 1962–63 has been marked as Coupe I, and Coupe VI which was worked during 1961–62 as Coupe XXX. This arrangement will not therefore alter the sequence of working of the coupes from that of the previous plan.

SECTION 5—METHOD OF EXECUTING FELLINGS.

327. *The annual coupe and its lay out.*—The annual coupe will be demarcated on the ground in accordance with the felling series map by cut lines 6 feet (1·83 metres) wide except where the boundary is already well defined by natural features. It should be borne in mind that the area of the coupe as shown in the management map is of more importance than the actual shape of the coupe. The correct area of the coupe will be computed on the basis of actual survey which must be done by an officer not below the rank of a Forester, but shall be countersigned by the Range Officer who will certify to the correctness of the survey after checking. The importance of the District Forest Officer or his Assistant (if one is posted) checking personally at least two coupes in the range is emphasised, as inaccurate survey may involve loss of revenue to the Government. Any small difference between the actual area of the coupe and its nominal area as shown in the folling series will not involve a deviation requiring sanction, so long as the difference does not exceed 5 per cent of the nominal area.

328. While carrying out the survey and demarcation of the fuel coupes, trees on the outer periphery of the forest in the adjoining portions not to be felled should be ring marked and numbered at breast height with red paint. A list showing the number, species, girth at breast height (over bark), and location (whether north, south, east or western boundary) will form part of the lease agreement. This will prevent to a great extent any clandestine extension of coupe limits by contractors.

329. *Division into strips.*—Each coupe will be divided into stripes. Coupes below 50 acres (20.23 hectares) in extent will be divided into two strips, while coupes above 50 acres (20·23 hectares) in extent will be divided into three strips. The strip lines will be cut by lines 3 feet (.91 metre) wide.

330. The sequence in which the three strips are to be worked will be left to the discretion of the District Forest Officer.

331. All annual coupe surveys shall be computed by the Range Officer and the field book submitted to the District Forest Officer by the end of October of the year previous to that in which the coupe is to be sold.

332. *Agency of exploitation.*—The fellings will be conducted through the agency of contractors as the system has been established and found to be satisfactory.

333. *Period of lease.*—The coupes will be put up for sale in January or early in February so as to provide time for resale by auction or by tender if the prices obtained at the first sale are not satisfactory. The coupe will be conveyed to the lessee on the 1st of April with a *voidah* of 6 months for coupes below 20 acres (8.09 hectares) in extent, and 9 months for coupes with an extent of 21-50 acres (10-20 hectares) which will commence from the 1st of April. For coupes with an extent of 51 acres (20.63 hectares) or more, a *voidah* of 11 months up to the 28th February will be granted. Although a *voidah* of one year is ordinarily granted to coupes of 51 acres (20.63 hectares) or more in extent elsewhere in the State, it will be restricted to 11 months in the Mettupalayam Range, as the felled coupes will have to be regenerated during the south-west monsoon and the territorial staff must have sufficient time to complete the preliminary regeneration operations in time.

334. Irrespective of the date of sale or delay in conveying the coupe to the lessee, no extention of *voidah* should be ordinarily granted. The Range Officer should ensure by frequent inspection that not only the work is carried out as per conditions of sale and that the progress of work is sufficient to complete the removals by the end of the period of contract.

335. *Coupe arrears.*—In the event of any coupe remaining unsold or portions of the coupe remaining unfelled within the lease period in any particular year, such portions will be sold in the subsequent year with such *voidah* as the District Forest Officer deems necessary unless he is satisfied that the area is not economically exploitable. In the latter event the District Forest Officer will record the facts in the control journal and make suitable entries on the control map.

336. *Reserved species.*—All sandal, tamarind, *Kadukkai, Pinnai,* Wood-apple, *Poochakottai, Pungam, Iluppai* and *Ilavam* occurring in the annual coupe will be ' reserved ' and shall not be felled under any circumstances by the coupe contractor. All the reserved trees will be marked and numbered with white paint at breast height before the coupe is offered for sale and a list showing the number of the trees, the species and its girth will form part of the lease agreement. It may however be possible that small saplings and seedlings of reserved species may not permit of such marking and numbering. The absence of any such marks or numbers, however, will not entitle the lessee to fell such prohibited trees.

337. *Felling and extraction rules.*—(1) The coupe should be felled in a systematic manner, strip by strip. A new strip may be entered into only after the Range Officer has personally satisfied himself that the work in the previous one has been satisfactorily completed.

(2) All reserved trees mentioned in paragraph 336 shall not be felled by the contractor, except such old or unsound trees as have been expressly authorized to be felled by the District Forest Officer.

(3) Excepting for the ' reserved species ' mentioned above, the contractor should clearfell all shrubs, trees and climbers even if the species is not required by him, or otherwise the proportion of unwanted species like *Kalli, Thanaku, Vandalai, Pachalai, Malankiluvai and Mulkiluvai, etc.*, will increase to the detriment of the more valuable species. If the contractor fails to comply with this provision, the trees left standing will be clearfelled by the Department and the cost thereof recovered from the contractor. A necessary condition to this effect should be introduced in the sale agreement.

(4) No tree growth within one chain on either side of perennial or semi-perennial stream or streams within or along the boundaries of the coupe should be felled. Such streams if any will be clearly marked on the surveyed sketch of each coupe attached to the sale list. This area of one chain on each side thus marked will however not be excluded from the total area of the coupe.

(5) Everything the contractor cuts shall be cut cleanly with sharp axes or bill-hooks as close to the ground as possible in any case within 6 inches (15·24 centimetres) from the ground level, in such a manner that the bark is not separated from the wood. No trimming of the stools is necessary.

(6) Sawing will be prohibited, except for felling trees or for billetting them into transportable sizes.

(7) Bamboos found inside the fuel coupe will be the property of the fuel coupe contractor; they will be felled by him in accordance with the felling rules for bamboos. The District Forest Officer will accordingly insert the necessary conditions to the agreement.

(8) The contractor will stack all cut firewood into stacks of such size as may be prescribed by the District Forest Officer prior to removal.

(9) If the contractor is desirous to remove any tree from his coupe in the shape of timber or poles he should get them hammer-marked by the Beat-Guard at stump site before removal.

(10) The contractor may construct at any time cart-tracks in any part of the coupe, irrespective of the strip he may be working in. He will make only the maximum number of earth slides that are absolutely necessary for the extraction of firewood from the upper slopes.

(11) All the operations in the coupe shall be undertaken only by the mazdoors of the contractors; either he or his authorized agent shall be present to supervise the work.

(12) No charcoal burning will be allowed under any circumstances in any fuel coupe or any part of the reserved forest as it is detrimental to forest growth.

338. *Supply of agricultural implements.*—The contractor shall at all times during the period of his contract sell to ryots on demand for their bonafide domestic and agricultural purposes all kinds of produce in the coupe at rates to be fixed by the District Forest Officer in consultation with the Collector.

339. The contractor shall also be bound to supply to the members of the Jaggery Co-operative Societies on demand, brushwood such as thorns and twigs of 6 inches (15·2 centimetres) and below in girth at such rates per head-load that may be fixed by the District Forest Officer in consultation with the Collector.

SECTION 6—TABULAR STATEMENT OF FELLINGS.

340. The following statement shows the coupes to be worked annually during the next ten years in each of the felling series included in the Fuel Working Circle :—

Name of felling series

Year of working.	Coupe number.	Sundapatti. Area in acres. (Hectares).	Jaccanare. Area in acres (Hectares).
(1)	(2)	(3)	(4)
1963–64	I	37·00 (24·28)	38·00 (15·38)
1964–65	II	56·00 (22·66)	36·00 (14·57)
1965–66	III	58·00 (23·47)	38·00 (15·38)
1966–67	IV	58·00 (23·47)	40·00 (16·19)
1967–68	V	58·00 (23·47)	38·00 (14·57)
1968–69	VI	52·00 (21·04)	42·00 (17·00)
1969–70	VII	52·00 (21·04)	50·00 (20·23)
1970–71	VIII	56·00 (22·66)	40·00 (16·19)
1971–72	IX	52·00 (21·04)	42·00 (17·00)
1972–73	X	50·00 (20·23)	40·00 (16·19)

341. The coupes to be worked in the succeeding five years in case the revision of the plan is not undertaken in time are indicated below.

Name of felling series

Year of working.	*Coupe number.*	*Sundapatti.* Area in acres (Hectares).	*Jaccanare.* Area in acres (Hectares).
(1)	(2)	(3)	(4)
1973–74	XI	54·00 (21·85)	40·00 (16·19)
1974–75	XII	54·00 (21·85)	40·00 (16·19)
1975–76	XIII	60·00 (24·28)	40·00 (16·19)
1976–77	XIV	56·00 (22·66)	38·00 (15·38)
1977–78	XV	60·00 (24·28)	36·00 (14·57)

SECTION 7—REGULATION OF REGENERATION OPERATIONS.

342. *Necessity for artificial regeneration.*—The forests included in this working circle are in general under-stocked. It is also noticed that even in the forests hitherto unworked, the proportion of useless species such as *Kalli*, *Thanaku*, *Vandalai*, *Pachalai*, *Malankiluvai* and *Mulkiluvai* is more than that of the more useful species. In areas which have been exploited in the past, these useless species were left standing with the result that for every rotation there is an increase in the proportion of these species. Added to this, all felled areas were subjected to dense growth of noxious weeds such as *Puchedi*, *Indu* and *Karu Indu* and coupled with the unsatisfactory response from coppice the stocking has been steadily going down at every rotation. It is therefore imperative to restock these forests artificially after clearfelling. Artificial regeneration will be done systematically over not less than one-third of the coupe in order to fully restock these forests once again.

343. As far as possible all artificial regeneration work prescribed in this working circle will be done in conjunction with *kumri* or raising of field crops and whenever there is a demand for it. *Kumri* should be encouraged as it boosts up the initial growth of the plants, which is so necessary for the ultimate success of plantation work in a low rainfall tract, apart from keeping in line with the policy of the Government to grow more food wherever possible. There will not be any difficulty in securing *kumridars* as there are as many as fourteen hill-tribe settlements inside the reserve forests. Demand for *kumri* will be also there from the labour population in the plains villages adjoining the fuel series.

344. Departmental *kumries* are not recommended as proper supervision cannot be provided: proper accounting presents great difficulty and success cannot always be guaranteed.

345. The *kumridars* will be allowed to raise crops such as *Ragi*, *Cambu*, *Varagu*, Horse-gram, Chillies, Cotton, etc. They will be permitted to remain in the regeneration area for the first two years of the plantation. Where the tree crop permits and conditions are congenial, the District Forest Officer may at his discretion extend the *kumri* cultivation for another one year. Under no circumstances, the *kumridar* will be permitted to remain for more than three years in the regeneration area.

346. The *kumridars* will be insisted to do all the weedings free of cost. Insisting on the *kumridars* to do the other regeneration operations also free of cost although economically laudable is fraught with dangers since the various stages of plantation work are likely to be delayed and the privileges also abused by them. The rest of the other operations will be threfore done departmentally.

347. In the eventuality of *kumridars* not being available, the plantation work will be carried out as usual, and the weedings done at departmental cost.

348. Before handing over the area for *kumri* cultivation, the District Forest Officer will execute an agreement with the individual *kumridars* under section 21 of the Madras Forest Act.

Preparation of the planting site.

349. *Burning.*—Soon after the contractor vacates the coupe, all remaining standing growth if any will be cut and this along with the felling slash will be piled and burnt before the end of April. The burning will be done more as a measure of improved sanitation of the area rather than as a method of regeneration and will be primarily aimed at getting rid of the mass of thorny weeds such as *Indu* and *Karu indu* already existing in the area. No special efforts will be therefore made to get a good burn. The burning will be done in such a manner as to not to disturb the active stools of useful fuel species.

350. *Regeneration technique.*—The method of line sowings will be adopted with the espacement between the lines kept at 11 feet (3.35 metres). This will be supplemented by pot plants put at intervals of 11 feet (3.35 metres) along the line, to make an espacement of 11 feet by 11 feet (3.35 metres by 3.35 metres). Since *kumri* regeneration has to be initiated for the first time in almost all the series, in order to encourage the hill folk to come forward for this work, an espacement of 16 feet (4.88 metres) between the lines will be adopted during the first year as a sort of compromise, in which case pot plants will be put at intervals of 8 feet (2.44 metres) to make an espacement of 16 feet by 8 feet (4.88 metres by 2.44 metres). In the subsequent years, the espacement will be reduced to 11 feet by 11 feet (3.35 metres by 3.35 metres).

351. The lines will be taken along the contour and the planting intervals along each line marked by means of 1 foot (0.31 metre) stakes collected locally. The soil along the entire length of the line will be worked to a dimension of 1 foot by 1 foot (0.31 metre by 0.31 metre) and the dug up soil heaped in the form of a mound along the line. Irrespective of the espacement adopted for the planting lines and the intervals along each line, pits 1 foot by 1 foot (0.31 metre by 0.31 metre) will be dug at an overlapping espacement of 30 feet by 30 feet (9.14 metres by 9.14 metres) all over the regeneration area to be planted with Tamarind. The aligning, staking and soil working will be completed before the end of May.

352. *Planting.*—The areas included in this working circle receive rain from both the monsoons, although the precipitation received from the north-east monsoon is quantitatively more. In order to take full advantage of the rain, planting should be done during the south-west monsoon itself, and casualties replaced during the north-east monsoon. It is quite possible that there may be heavy casualties during some years before October either due to scanty precipitation from the south-west monsoon or due to complete lack of rains during the gap between the south-west and north-east monsoons. The should not deterus from south-west monsoon planting as the few plants that survive will grow to a sufficient size by January that they will certainly be able to withstand the rigours of the summer which is not the case always with plants put during the north-east monsoon. The casualties can be always replaced during the north-east monsoon when the precipitation is more.

353. The first showers of the south-west monsoon may be received at any time after the first week of June. As soon as the rains set in, seeds of Neem, Tamarind, *Karuvelam*, *Kodaivelan* and *Velvagai* should be sown along the lines. Preference should be given to Neem and Tamarind as both the species are very hardy. At the same time, 1–2 years old pot plants not less than 18 inches (45.7 centimetres) in height of Neem and Tamarind will be put at each stake planted at intervals on the planting lines. In case *Eucalyptus* hybrid suggested in paragraph 323 shows definite promise it should be also utilised on an extensive scale preferring it over the much slower grown indigenous species. *Eucalyptus* hybrid can be raised by planting naked transplants directly in the field. The planting however should be done in rainy or cloudy weather or else the casualties are bound to be heavy. The lateral leaves should be neatly nipped off by means of a pair of scissors. This will prevent the dropping of the terminal shoot on account of the loss turgidity. The reduction in the leaf surface will also reduce the transpiration rate. Plants 6 inches (15.2 centimetres) to 18 inches (45.7 centimetres) are ideal for naked transplanting. Casualties should be replaced by pot plants of similar size.

354. At the same time, 2 years old pot plants of Tamarind will be planted all over the regeneration area at an overlapping espacement of 30 feet by 30 feet (9.14 metres by 9.14

metres) in pits of 1 foot by 1 foot (0.31 metre by 0.31 metre) dug and kept ready. In the case of Tamarind, 2 years old pot plants are prescribed as past experience has proved that younger seedlings are likely to fail.

355. The base of the pots should be broken before planting. No retrieving of the pots will be done. The planting should be completed within 3 or 4 days by employing the maximum number of mazdoors so that the plants take full advantage of the short monsoon in order to grow up quickly to a sufficient height to withstand the rainless break between the south-west and north-east monsoon periods.

SECTION 8.—NURSERY.

356. *Seed collection and storage.*—The following table indicates the time for seed collection for the species recommended for planting.

Serial number and name of species.		Time of collection of seed.
1	Neem	June—August.
2	*Velvagai*	February—March.
3	Tamarind	February—April.
4	*Kodaivelan*	July—September.
5	*Karuvelam*	April—May.

357. The seeds should be collected locally from sound and well-grown trees. Seeds of *Eucalyptus* hybrid should be obtained from the State Silviculturist, Madras as none of them will be available within the Central Coimbatore Forest Division presently.

358. Seeds of Neem are not viable if stored for a long time owing to the oily nature of the seeds. Seeds of the remaining species retain their viability for a year if stored properly. They should be separated from the pericarp, dried and stored in gunny bags and used the same year.

(a) *Preparation of pot plants of Neem, Velvagai and Tamarind.*

359. The method of preparing pot plants for these species are described below. The nursery technique for *Eucalyptus* hybrid being different, is described separately.

360. Past experience in the Coimbatore Central Division as also elsewhere in the State has shown that one of the chief causes of failure of dry fuel regeneration areas is due to planting of small seedlings in the field. As the conditions in summer are fairly severe, the smaller seedlings do not develop a sufficiently long root system by the onset of summer to tide over the drought period. It is therefore very necessary that older plants of at least 18 inches (45.7 centimetres) in height are put. To prevent these plants from putting over a long root system before actual transplanting in the field, they should be raised in closed containers. Past experience with bamboo, reed or palmyrah containers has shown they are all short-lived and the root system gets invariably disturbed during the course of transplanting. To get over this difficulty, closed earthern pots 3/4 to 1 foot (0.23 to 0.31 metre) high with a diameter of 4 inches (10 centimetres approximately) at the top will be used. One or two small holes will be made at the bottom of the pot to allow drainage of excessive moisture. These pots will be filled with good loamy soil and rammed so that the soil layer is an inch (2.5 centimetres) below the top of the pot to facilitate watering. The pots should be got ready by June, two years before the planting year.

361. Two seeds of Neem, Tamarind and *Velvagai* should be sown per pot during the months of June to September, 18 months to 2 years prior to the date of planting depending on as and when fresh seeds become available. The seeds quickly germinate. Re-sowing will be done a fortnight later in such of these pots where germination is absent. The pot plants should be watered during non-rainy days and kept free from weeds. The watering should be done sparingly in order to acclimatise the plants to the dry conditions in the field. The pots should be kept under shade for sometime until they strike root in the pots. Subsequently they should be kept in the open. In either case they should be kept near a water source so as to facilitate watering. Care should be taken to provide for sufficient number of pot plants that may be required for the annual regeneration areas and for replacement of casualties.

Nursery technique for Eucalyptus hybrid.

(b) Seeds of *Eucalyptus* hybrid being very minute, they cannot be sown directly in the pots. Hence they have to be sown first in nursery beds and when of sufficient size transferred to the pots. The nursery technique is described below in detail.

362. *Formation of beds.*—A suitable nursery site with good loamy soil should be selected near a water source and cleared of all growth, stumps if any being uprooted. The soil should be dug to a depth of 18 inches (45.7 centimetres) and the clods broken and stones and pebbles if any carefully removed during the process. The soil should be allowed to weather for a couple of months. Standard beds of 40 feet by 4 feet (12.2 metres by 1.2 metres) should be formed leaving an intervening space of 1½ feet (0.45 metre) to facilitate watering, weeding and inspection. The beds should be raised 9 inches (23 centimetres approximately) high supported at the sides by split bamboos, poles or other convenient material, so as to ensure good drainage. Beds should be laid along the contour and not across it. The surface of the beds should be given a slight camber to prevent stagnation of water. No shading of the beds will be normally required.

363. The formation of the beds should be completed by the end of September.

364. *Sowings.*—*Eucalyptus* hybrid seeds number about 8,000 to an ounce. The seeds being very minute they should be mixed with ash or fine earth before they are broadcast sown on the beds. For a standard bed of 40 feet to 4 feet (12.2 metres by 1.2 metres), four ounces (113 grams approximately) will be used. It is not advisable to sow heavier than 4 ounces (113 grams approximately) as it produces congestion and results in lanky plants. The sowing must be completed before the 15th of October.

365. As the seedlings are susceptible to drip, no shade is necessary as the north-east monsoon commences round about October. The beds must be watered on non-rainy days but sparingly enough to prevent excessive growth. The seedlings will be about 12 to 18 inches (30.5 to 45.7 centimetres) within 9 months of sowing, when they are suitable for direct transplanting in the field. Large seedlings or seedlings smaller than 6 inches (15.2 centimetres) are unsuitable for naked planting.

366. *Preparation of pot plants.*—When the seedlings are about 6 inches (15.2 centimetres) high, they should be removed from the beds and transferred to pots of the same size referred to in paragraph 360 filled with good loamy soil and kept ready. The pot plants must be kept under shade until they strike root after which they should be kept in the open. The pot plants should be watered sparingly in order to acclimatise the plants to field conditions.

367. A standard bed of 40 feet by 4 feet (12.2 metres by 1.2 metres) will yield about 4,000 seedlings and hence for a 11 feet by 11 feet (3.35 metres by 3.35 metres) espacement, one standard bed will be sufficient for planting eight acres (3.24 hectares) including replacement of casualties if *Eucalyptus* hybrid is planted pure.

SECTION 9—SUBSIDIARY SILVICULTURAL OPERATIONS.

368. *Replacement of casualties.*—All casualties must be replaced during the north-east monsoon. Ungerminated gaps on the lines should be sown afresh with seeds. Similarly pot plants must be put at stakes where the original planting has failed.

369. Casualties of the first year will be also replaced during the second year along with the south-west monsoon.

370. *Tending*—(a) *First year.*—Three weedings will be done during the first year. The weeding will consist of scraping off all miscellaneous growth competing with the plants and uprootal of all *Puchedi*, *Indu* and *Karu Indu* occurring inside the coupe. At the same time, a climber cutting will be done over the entire regeneration area. The first weeding will be done in July. The second weeding will be done in October a little prior to the setting of the north-east monsoon combined with a soil working to a depth of 3 to 6 inches (7 to 15 centimetres approximately) and a width of 9 inches (22 centimetres approximately) at a distance of a foot (0.31 metre) away from the centre of the planting line. The mounds along the planting lines will be reformed at the same time to prevent stagnation of water around the base of the plants.

371. A third weeding combined with soil working will be done late in December when the north-east monsoon has abated. The mounds will be reformed at the same time.

372. In the latter half of February, a hot weather mulching will be done around the plants.

373. *Second year.*—In the second year, three weedings will be carried out. The first weeding will be done in June combined with a soil working. The mounds will be reformed at the same time. At the time the first weeding is done, a selective tending of the coppice shoots will also be done. Coppice shoots of useful fuel species occurring within the coupe will be selectively retained where the planted seedlings have failed and the number of shoots reduced to two or three per stool. Climbers smothering the coppice shoots will be also cut at the same time. The rest of the coppice will be cleared off the regeneration areas as it is not necessary to encourage coppice growth when the planted seedlings have established.

374. The second weeding will be done in August combined with soil working and reforming of the mounds.

375. A third weeding coupled with soil working will be done in December and this will be for the backward plants only.

376. *Third year.*—Ordinarily, no tending operations are prescribed for the third year. If in any case the plantation remains not properly stocked due to unforeseen reasons, the District Forest Officer will prescribe such operations as he deems it necessary after obtaining the prior orders of the Conservator of Forests.

SECTION 10—OTHER REGULATIONS.

377. *Demarcation.*—The coupes will be demarcated with stones at the four salient corners engraved with the coupe number and the year of felling as well as the adjacent coupe number and its years of working. The number of a coupe is governed by the actual sequence of fellings, so that if the sequence allotted in this plan is revised for any reason, the numbers should also be revised so as to conform with the revised sequence.

378 *Plantation boards.*—The area regenerated in each year's coupe will be indicated by a small wooden board of uniform size fixed at salient points. The board should indicate in English and in Tamil the year of formation and the actual area planted.

379. *Fencing.*—A live fence of *Seemai Vanni* (*Prosopis julieflora*) will be raised a year in advance of regeneration at the time the coupe is demarcated. Seeds of *Seemai vanni* will be sown all along the periphery of the coupe in a foot (.31 metre) wide strip after working it to a depth of 1 foot (.31 metre) and heaping the dug out earth in the form of a mound in the centre of the strip. It is possible that a few openings may be created in the live fence by contractors' men or mazdoors engaged on regeneration work taking short-cuts to reach the coupe. These few vents can be closed by fresh sowing in the gaps after the planting is over. As the *Seemai Vanni* may not grow to a sufficient size within a year or two, a thorn fence will be also raised during the year of planting and maintained until the live fence will be able to take the place of the thorn fence.

380. *Closure to grazing.*—All felled coupes will be normally closed to grazing for a period of five years, excluding the area of exploitation, in view of the artificial regeneration prescribed. It will be however open for the District Forest Officer to obtain orders from the Conservator of Forests for early opening in the case of quicker growth and it will be equally obligatory for the District Forest Officer to extend the closure for a longer period in case of poor growth or any other reason.

381. All closed areas will be distinguished by prominent notice boards painted red and engraved in white letters, in Tamil and in English notifying the fact of closure to the public. The closure will be also notified in the District Gazette in the manner prescribed in the chapter on Grazing Working Circle.

382. *Fire protection.*—Situated as the fuel series are mostly along the lower slopes of the deciduous forests, they are subjected to periodical fires during the dry season. Any fire that may occur must be immediately extinguished by the local subordinates. The closure of areas burnt after a big fire has occurred is essential for the recovery of the area

and must be rigidly enforced. To be effective, such closure must follow immediately after the fire. The procedure to be adopted is detailed under the prescriptions of the Grazing Working Circle.

383. For the areas under regeneration, it is considered that an annual clearing up of the periphery of the regeneration area is quite adequate to prevent the entry of any chance fires.

384. *Staff.*—Since there would not be ordinarily more than one fuel series in a beat and the regeneration area in each year's annual coupe is by itself no means large, it is considered that employment of special staff would be quite superfluous. A plot watcher will be employed during the first year of each plantation who will attend to the various cultural works in the regeneration area. The regeneration works can very well be attended to by the local staff assisted by the plot watcher.

385. During the second year, the intensity of work being much less, it is considered not necessary to employ a separate plot mazdoor. The plot mazdoor of the current year's regeneration area can look after the previous years' regeneration area also.

SECTION 11—CONTROL.

386. *Record of statistics.*—The contractor will furnish to the Range Officer not later than the 10th of every month, a statement showing the removals of the previous month of fuel in stacks or cartloads and under cover of head-load permits, manure leaves, and species and volume of small timber extracted in cubic feet and cubic metres.

387. The Range Officer will send a monthly abstract of these accounts for each coupe in the range to the District Forest Officer so as to reach him by the 20th of the same month. The total removals of fuel and small timber during the year will be abstracted in the District Forest Office and entered in the lease register and the control book. The following conversion factors will be adopted :—

75 cubic feet (2.10 centimetres) of stacked fuel=1 ton of fuel (1.016 metric tonne).

50 cubic fee (1.40 centimetres) of timber=1 ton of timber (1.016 metric tonne).

40 head loads of fuel=1 ton of fuel (1.016 metric tonne).

388. *Control.*—The following control records will be maintained by the District Forest Officer :—

(1) Control book.

(2) Record of works.

(3) Control journal.

(4) Control maps.

(5) Plantation and nursery journals.

389. The manner in which these records are to be maintained are indicated in Sections M and N under the chapter on Miscellaneous Regulations.

CHAPTER IV —WORKING PLAN FOR THE REHABILITATION WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

390. *Objects of management.*—The main object of this working circle is to rehabilitate the degraded ex-panchayat forests of the region by artificial regeneration of fuel species which are best suited to the tract and thereby increase the fuel and small timber supply to the nearby towns of Erode, Punjai Puliampatti, Coimbatore and Mettupalayam and the villages adjoining these forests.

391. *General constitution.*—This working circle consists of all the ex-panchayat forests within the region. The working circle will include large areas which were subjected to artificial regeneration in the past but with unsuccessful results as these areas are in the heart of the plains and when developed can form valuable sources of firewood to the public. Steep or extremely rocky or gravelly sites unsuitable for regeneration, and areas sucessfully regenerated in the past have been excluded.

392. The area of this working circle is 11,720 acres (3,762.96 hectares).

393. *Character of the vegetation.*—The type of forests met within this working circle is the one referred to by Champion as the Southern Cutch thorn forest, a detailed description of which is given in Chapter II of Part 1. The present growth consists of a scattered growth of only thorny and useless trees as *Mulkiluvai, Kalli, Thanaku, Vandalai, Malankiluvai* and *Anaimullu* with a few scattered coppicing stools of *Unjal* and *Palai*. On extremely eroded sites with little or no top soil, very often the only vegetation consists of *Athondai, Virali, Avaram* and scrub.

Section 2—Division of the area.

394. *Division into planting series.*—The area covered by this working circle is divided into five planting series, with a view to distribute the centres of regeneration to three different beats.

395. The following statement shows the constitution of the planting series :—

Serial number and name of planting series.	Area in ACRES.	(HECTARES).
(1)	(2)	(3)
(*a*) *Mettupalayam Range.*		
1 Mettupalayam rehabilitation series	1,500	(607·03)
2 Pethikuttai rehabilitation series	1,500	(607·03)
(*b*) *Bhavani Range.*		
3 Velamundy East rehabilitation series	2,900	(1,173·60)
4 Velamundy West rehabilitation series	4,320	(1,748·26)
5 Erode rehabilitation series	1,500	(607·03)

396. The areas included under all the planting series have been shown on the management maps.

Section 3—Analysis and valuation of the crop.

397. *Stockmapping.*—The areas proposed to be included in this working circle have been carefully stockmapped and only such of those areas suitable for regeneration have been demarcated for planting. The suitability of an area has been judged with reference to the quality and composition of its existing growth, slope of terrain, nature of the soil and its depth as revealed by trial pits. Predomnantly rocky and steep or very bouldery or gravelly sites unsuitable for artificial regeneration work have been excluded.

398. *Valuation of the crop.*—As the areas included in this working circle do not contain any exploitable growth, no valuation surveys were considered necessary.

Section 4—Method of treatment.

399. *Silvicultural system.*—The silvicultural system adopted will be to artificially restock these degraded areas with suitable fuel species in as quick time as possible after clearing off the existing stand of useless thorny scrub and climbers wherever present.

400. *Choice of species.*—The forests included in this working circle are low rainfall tracts with an average annual precipitation of about 60 to 70 centimetres. Moreover, the soil is a shallow bouldery loam and only hardy fuel species can succeed in these areas. In the past, cashew, several species of *Eucalyptus* and a host of miscellaneous fuel species have been tried. Of all the species tried, only Neem and Tamarind have done well wherever they were tried. Hence it is suggested that these two species alone will be tried. In addition, *Eucalyptus* hybrid which is showing promise during the past few years of being suitable for afforesting degraded areas, is also prescribed if found suitable.

401. *Rotation.*—As the fuel plantations are to be initiated with the enforcement of this working plan, considerations of rotation at the present juncture are only of theoretical interest. Tentatively, a rotation of thirty years will be adopted as for the Fuel Working Circle. The necessity to increase or decrease the rotation period may be however examined at the time of revision of this working plan.

402. *Annual planting area.*—During the past ten years, extensive regeneration work was done in the areas included in this working circle but practically every regeneration area has been a failure. While of course it is very necessary that all these areas must be planted up again, it must be borne in mind that any future regeneration programme should be over small areas annually in each series so that personal attention can be given to each plantation and measures alien to conventional forestry like minimum watering will have to be afforded in order to help the plants to establish themselves. The problems in afforesting these areas are manifold. The soil is gravelly or bouldery with practically no top soil. The annual rainfall is barely 60 to 70 centimetres a year. The areas had been under panchayat management for over quarter of a century during which period they were practically erased to the ground and the soil exposed to the sun for years. Considering all these obstacles it is therefore of utmost importance that only small areas should be tackled annually to achieve any success. It is therefore prescribed that a small area of 50 acres (20.23 hectares) will be taken up annually in each series. In the Mettupalayam, Pethikuttai and Erode series the total area of each series being 1,500 acres (607.03 hectares), planting 50 acres (20.23 hectares) annually will conform to a thirty-year rotation so that a normal series of age gradations can be achieved. In the Velamundy East and West series where the total area of the series is more than 1,500 acres (607.03 hectares), the annual planting area will be restricted to 50 acres (20.23 hectares) in view of the difficulties expressed above.

403. The annual planting area in each series for the next fifteen years have been marked on the management maps prepared and appended to this plan.

Section 5—Regulation of regeneration operations.

404. *Survey and demarcation of the annual regeneration area.*—The annual regeneration area will be demarcated on the ground in accordance with the planting series map by cut lines 6 feet (1.83 metres) wide except where the boundary is already well defined by natural features.

405. The survey and demarcation must be completed at least five months before the actual planting.

406. *Clearing.*—All standing growth except coppice or seedling growth of useful fuel species, such as Neem, *Usil*, *Palai* and *Porasu*, etc., in the regeneration area will be cut before the end of March. As much of the rank growth in the areas included in this working circles consists of useless species such as *Mulkiluvai*, *Anaimullu*, *Malankiluvai*, *Boothalai*, *Indu*, etc., the clearing will prevent these species from acting as mother trees and multiplying. Any saleable material obtained from the cutting will be stacked in stacks of 5 feet × 4 feet × 2½ feet (1.52 metres × 1.22 metres × .76 metres) and sold by auction.

407. *Method of regeneration.*—In view of the acute drought prevalent in the areas included in this working circle, it is absolutely necessary that some water conservation measure is adopted to achieve any success. The 'trench and mound' technique with short trenches of 3 feet × 1 foot × 1 foot (.91 metres × 31 metre × 31 metre) will be therefore adopted. Minimum watering facilities once in a fortnight during the dry months will be also provided.

408. *Preparation of the planting site.*—Soon after the existing growth is cleared, short trenches 3 feet × 1 foot × 1 foot (.91 metre × .31 metre × .31 metre) will be dug along the contour at a distance of 11 feet (3.35 metres) from centre to centre. The distance between the succeeding lines will be kept at 11 feet (3.35 metres) so as to make an espacement of 11 feet × 11 feet (3.35 metres × 3.35 metres). The trenches in the succeeding lines will be staggered in order to collect all the water that drains down the slopes as shown in Figure 1. The dug out earth will be put on the low hill side to form a mound to receive the seedling and stabilised by a few pebbles or boulders in order to prevent soil wash as shown in Figure 2. All these operations should be completed by the end of August.

PLAN OF PLANTING

Size of trench = 3′×1′×1′
Scale—1 inch = 1 foot.

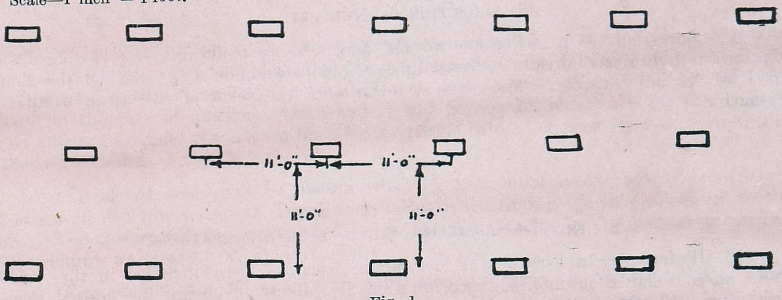

Fig. 1

CROSS—SECTION

Scale—1″ = 1 foot.

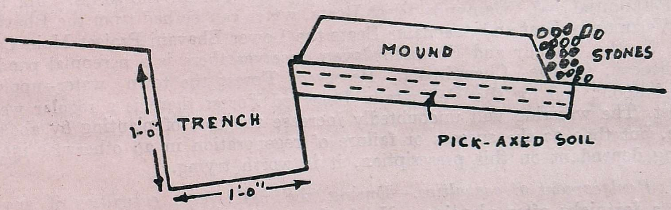

Fig. 2

409. *Planting.*—The areas included in this working circle receive rain mainly from the north-east monsoon, precipitation from the south-west monsoon being practically negligible. The first showers of the north-east monsoon may be received at any time after the first week of October. As soon as the rains set in, pot plants of Neem, Tamarind and *Eucalyptus* hybrid from nursery raised stock kept ready will be put in the centre of the mound, care being taken to see that the plants get the least shock during the transport and planting. In the case of Neem and Tamarind, pot plants 1-2 years old and about 18 inches (45.72 centimetres) in height are ideal. For *Eucalyptus* hybrid, pot plants of 9 to 18 inches (22.86 to 45.72 centimetres) are said to be ideal.

410. The base of the pots should be broken before planting. No retrieving of the pots will be done. The planting should be completed within three or four days by employing the maximum number of mazdoors, so that full advantage of the short monsoon is taken to enable the plants to grow up quickly to a sufficient height to withstand the rainless break between the south-west and north-east monsoon periods and the rigours of the coming summer.

411. *Kumri.*—*Kumri* or planting of agricultural crops in conjunction with the forest crop is not prescribed as the soil and rainfall conditions are not conducive for such work.

SECTION 6—NURSERY.

412. Notes on seed collection, storage and nursery technique for Tamarind and *Eucalyptus* hybrid are already outlined in detail in paragraphs 356 to 357 of the chapter on Fuel Working Circle. The nursery technique for Neem is the same as that for Tamarind

SECTION 7—SUBSIDIARY SILVICULTURAL OPERATIONS.

413. *Watering.*—In localities of low rainfall such as those included in the working circle, mere reliance on monsoon precipitation is unlikely to ensure the desired success. Most often the north-east monsoon is irregular, scanty or completely fails altogether. It is therefore necessary to adopt measures alien to conventional forestry, such as minimum watering during the dry months so as to enable the plants to establish themselves. Watering each plant with five litres of water once a fortnight during the dry months until the north-east monsoon of the next year sets in is therefore provided. The watering may be however curtailed for a fortnight on receipt of any chance rains within the regeneration area during the dry period. Water can be transported to the regeneration site by means of a mobile water van sanctioned for the division which can be stationed at Bhavanisagar. Until such time a water van is sanctioned by the Government, water may be transported in drums placed on a hand cart. This may not be a convenient arrangement but can be adopted as a temporary measure until a regular van is purchased. There will be no difficulty in obtaining water which is within easy reach of all the series. For the Nellimalai, Pethikuttai and Velamundy West Beats, water can be had from the Bhavani river; for the Velamundy East and Arachalur Beats the Lower Bhavani Project Main Canal runs closeby; for the Voipady and Kongampalayam reserves there is a perennial pond (*kuttai*) quite adjacent; for the Chennimalai Reserved Forest the town water-supply can be depended upon; and for the Velligaradu Reserved Forest there is a regular well within the forest. The watering will undoubtedly increase the cost of planting by about Rs. 50 per acre, but then as the success or failure of regeneration in an otherwise inhospitable site being dependant on this prescription, it is worth trying.

414. *Replacement of casualties.*—During the first year, casualties if any will be replaced a fortnight after planting. No further replacements will be made during the first year.

415. Casualties of the first year will be also replaced during the second year along with the north-east monsoon.

416. *Tending.*—Three weedings during the first year and two weedings during the second year combined with climber cutting and soil working will be done as for the plantations raised under the Fuel Working Circle. The mode of tending to be done is the same as detailed under paragraphs 370 to 376 of the Fuel Working Circle as the type of area, regeneration technique, espacement adopted and species to be planted under the prescriptions of this working circle are identical with those of the Fuel Working Circle.

SECTION 8—OTHER REGULATIONS.

417. *Plantation boards.*—Each year's plantation will be indicated by a small wooden plantation board of uniform size fixed at salient points. The board should indicate in English and in Tamil, the year of formation and the actual area planted.

418. *Fencing.*—A live fence of *Seemai Vanni* will be raised a year in advance of regeneration. Seeds of *Seemai Vanni* will be sown all along the peripery of the coupe in a 1 foot (.31 metre) wide strip after working it to a depth of 1 foot (.31 metre) and heaping the dug out earth in the form of a mound in the centre of the strip. It is possible that a few openings may be created in the live fence by the mazdoors engaged on preparatory works by taking short cuts to reach the regeneration area. These few vents can be however closed by fresh sowing in the gaps after the planting work is over. As the *Seemai Vanni* may not grow to a sufficient size within a year or two, a thorn fence will be also raised during the year of planting and maintained until the live fence will be able to take the place of the thorn fence.

419. *Closure to grazing.*—All the regeneration areas will be normally closed to grazing for a period of five years including the year of formation. It will be however open for the District Forest Officer to obtain orders from the Conservator of Forests for early opening in the case of quicker growth and it will be equally obligatory for the District Forest Officer to extend the closure for a longer period in case of poor growth or any other unforeseen reasons.

420. All closed areas will be distinguished by prominent notice boards pointed red and engraved in white letters in Tamil and in English notifying the fact of closure to the public. The closure will be also notified in the District Gazette in the manner prescribed in the chapter on Grazing Working Circle.

421. *Fire protection.*—No special fire protection measures are necessary. It is considered that an annual clearing of the plantation boundaries will be quite adequate to prevent the entry of any chance fires.

422. *Plot mazdoors.*—In order to bestow necessary attention to the plantation, a plot watcher will be employed during the first year of each plantation. He should attend to the various cultural operations in the regeneration area.

423. During the second year, the intensity of work being much less, it is considered not necessary to employ a separate plot mazdoor. The plot mazdoor of the current year's regeneration area can look after the previous year's regeneration area also.

424. *Staff.*—No special staff are considered necessary. The Section Forester can attend to the works in the plot with the help of the plot mazdoor who will help him in recruiting mazdoors and in carrying out the various operations prescribed.

SECTION 9—CONTROL.

425. A record of works, control journal, control maps, plantation and nursery journals will be maintained for this working circle. The manner in which these records are to be maintainea are indicated in sections 'M' and 'N' under the chapter on Miscellaneous Regulations.

CHAPTER V—WORKING PLAN FOR THE IRRIGATED TEAK PLANTATION WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

426. *General constitution.*—This working circle will include all the teak plantations raised in the Hulikal Durg Reserved Forest and included under the Teak Pole Working Circle in the previous plan. It will also include the teak plantations raised in the Odanthorai Reserved Forest by the method of irrigation as also areas proposed to be converted into irrigated teak plantations in the future. The two small isolated teak

plantations raised in the Thattaipallam Valley are also included in the working circle. A list of all the plantations is given in Appendix IV as also in Chapter VI of Part I.

427. *Area.*—**The area of this working circle** is 4,881.25 acres (1,969.28 hectares). Of this, an area of 618.25 acres (250.20 hectares) consists of existing teak plantations.

428. *Character of the vegetation.*—The Odanthorai Reserved Forest and the Thattaipallam Valley naturally consist of the Southern Cutch Thorn Forest (Champion's type 5a/C1) whereas the Hulikal Valley originally consisted of a Dry Mixed Deciduous type of forest. A detailed description of both these forest types are given in Chapter II of Part I.

Section 2—Division of the Area.

429. The area covered by this working circle has been divided into two felling series. The Hulikal plantations are constituted into one series, viz., the Hulikal Series. The Odanthorai and Thattaipallam plantations and the areas proposed for conversion in the Odanthorai Reserved Forest are constituted into another series, viz., the Odanthorai Series. The following statement shows details of the area under each felling series.

Serial number and name of the felling series.	Area already planted in		Area to be planted up in		Total area in	
	ACRES.	(HECTARES.)	ACRES.	(HECTARES).	ACRES.	(HECTARES).
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Hulikal	46·25	(18·72)	Nil.	..	46·25	(18.72)
2 Odanthorai ..	572·00	(231·48)	4,263·00	(1,725·19)	4,835·00	(1,956·27)

Section 3—Analysis and Valuation of the Crop.

430. *Stockmapping of areas suitable for teak planting.*—A stockmapping of the areas suitable for conversion into teak in the Odanthorai Reserved Forest has been already done by Mahmood Hussain. As the Chief Conservator's orders were to merely separate Hussain's prescriptions from the composite plan without effecting any change, it was not considered necessary to do a fresh stockmapping of the areas proposed for conversion.

Section 4—Method of Treatment.

431. The raising of teak plantations in a deciduous forest consisting of thorny fuel species may seem at first sight to be a silvicultural mistake. The technique of raising teak by the method of irrigation in the Hulikal Durg Reserved Forest has proved to be successful that the work was extended to Odanthorai also. The rapid height growth shown by the teak under the method of irrigation, the demand for teak in the market and the profit gained by clearfelling the Hulikal plantations has been a clear incentive for extending this work on a larger scale.

432. *Silvicultural system.*—The silvicultural system adopted for the Hulikal Series will be the 'simple coppice' system supplemented by artificial regeneration wherever necessary. In the Odanthorai Series, the existing natural forest will be clearfelled and artificially regenerated with teak. In both the series, regeneration will be done under the method of irrigation.

433. *Choice of species.*—Teak will be the main species used in regenerating the clearfelled areas. In slightly elevated patches where irrigation water does not reach, *Eucalyptus* hybrid will be planted, as teak is likely to stagnate in such areas. In low-lying portions tending to be swampy, *Eucalyptus rostrata* or *Karumarudu* will be planted.

434. *Rotation.*—In the Hulikal teak plantations, experience has shown that the best rotation for pole production is twenty years and that beyond the age of twenty, casualties occur due possibly to lack of soil depth. The Odanthorai Reserved Forest is situated under very similar factors of locality. It is therefore prescribed that here too the rotation will be twenty years.

435. *Regulation of the yield.*—The Hulikal Series has been divided on an area basis into 20 almost equi-productive compartments by Mahmood Hussain, of which one compartment is clearfelled and regenerated annually. This division will be continued during the period of this plan also. In the Odanthorai Series as none of the plantations will come for felling during the period of this plan, the question of regulation of the yield will not arise at present.

436. *Annual regeneration area.*—In the Hulikal Series, regeneration will be chiefly from coppice which will be supplemented by artificial regeneration in patches where there is no growth at present or where the coppice growth is not satisfactory.

437. In the Odanthorai Series, the total available area of planting has been estimated to be 4,800 acres (1,942.51 hectares). Adopting a rotation of 20 years, an annual planting area of 240 acres (97.12 hectares) has been fixed by Mahmood Hussain in his plan. In practice it has been however found not possible to plant such a large area annually for reasons already mentioned in paragraph 229 of Chapter V of Part I. The annual planting area has been therefore reduced to 100 acres (40.47 hectares) annually since 1960 under the orders of the Conservator of Forests. It is therefore prescribed that an area of 100 acres (40.47 hectares) be taken up for planting annually irrespective of rotation considerations in view of the practical difficulties experienced.

SECTION 5—METHOD OF EXECUTING FELLINGS.

438. *Selection of the area.*—The lay out of the blocks proposed for exploitation and regeneration in the Hulikal Series are shown on the concerned management map. For the Odanthorai Series, the lay out of the annual coupes is not shown on the management map as the extension of the main canal for irrigating the future plantations is yet to be executed by the Public Works Department. As the plantations to be raised have to be all laid out below the contour level of the canal, the discretion to select the annual regeneration area is left to the District Forest Officer. The felling series boundary is however marked on the management map for the guidance of the District Forest Officer.

439. *Demarcation and survey of the annual area.*—The annual coupe will be surveyed and demarcated by means of cleared lines 6 feet (1.83 metres) wide. This should be completed at least 15 months before the month of planting so as to ensure that the exploitation of the area and the preliminary regeneration operations are carried out as per schedule and timely planting done. In the Hulikal Series, an enumeration of the timber in the coupe should be made and the total cubical contents of the available timber estimated. In the Odanthorai Series where the unconverted forest is only a thorny scrub, no such enumeration becomes necessary.

440. *System of exploitation—(a) Hulikal Series.*—In the Hulikal Series which contains valuable timber, all exploitation will be done departmentally. The trees will be felled, converted and dragged to road side depots where they will be classified and sold in auction by lots.

441. Before conversion, trees suitable for electric transmission poles will be separated and converted according to the prescriptions laid down by the Forest Utilization Officer and made available to the Electricity Board under his directions. The remaining produce will be converted into poles, if their girth at butt end is 36 inches (91 centimetres) and less adopting the following classification :—

Poles below 12 inches (30·5 centimetres) in girth at butt end.

Poles of 1-2 feet (61 to 30·5 centimetres) in girth at butt end.

Poles of 2-3 feet (61 to 91·4 centimetres in girth at butt end.

Trees with a buttend girth of over 36 inches (91·4 centimetres) will be treated as logs and measured in volume.

442. Miscellaneous growth unfit for sale as poles and top ends of teak will be converted into fuel and stacked in stacks of 5 feet × 4 feet × $2\frac{1}{2}$ feet (1.53 metres × 1.21 metres × .76 metre).

443. Both the poles and fuel will be transported to road side depots where they will be classified in the order mentioned above and sold in auction by lots. From the time felling is taken up till the 31st of March, brushwood available in the coupe will be sold under cover of permits issued by the Forest. Careful supervision will however be necessary to ensure that illicit fellings or damage to any standing teak or sandal do not result.

444. (*b*) *Odanthorai Seiies.*—In the Odanthorai Series, where the existing natural forest has to be cleared for conversion into plantations, the exploitation will be done through the agency of contractors. The coupe will be put up for sale by open auction in February so as to allow time for resale by tender or by auction in case satisfactory prices are not obtained in the first sale. The period of lease will be not more than 9 months from 1st April to 31st December. No extension of *voidah* will be granted under any circumstances as this will upset the time schedule for the preliminary regeneration operations and thereby delay the planting.

445. The contractor will be required to cut all growth to a height not exceeding 6 inches (15 centimetres) from the ground. In order to reserve sufficient material on the ground to ensure a burn, twigs and branches below 6 inches (15 centimetres) in girth should not be removed. For this purpose, removals by head loads will be prohibited.

446. If there is any likelihood of the contractor being unable to finish the work of felling and removal within the allotted period, the produce left over if any will be forfeited to Government, and any or all of the operations will be done departmentally. No extension of *voidah* beyond 31st December will be granted under any circumstances.

SECTION 6—TABULAR STATEMENT OF FELLINGS.

447. The areas proposed for felling in the Hulikal Series are given in the following statement.—

(*a*) *Hulikal Series.*

Regeneration area or compartment number.	*Year of formation.*		*Area in acres (hectares).*	*Year of final felling.*	*Remarks.*
(1)	(2)		(3)	(4)	(5)
1	1932	(Coppiced in 1964 and patch regeneration done in 1956).	3·25 (1·31)	1974	..
2	1933	(Coppiced in 1955 and patch regeneration done in 1956)	2·13 (0·86)	1675	..
3	1933	(Coppiced in 1956 and patch regeneration done in 1957)	2·12 (0·86)	1976	..
4	1933	(Coppiced in 19[illegible] and regeneration done in 1958).	2·33 (0·94)	1977	..
5	1934	(Coppiced in 19[illegible] and regeneration done in 1959).	2·95 (1·19)	1978	..
6	1936	(Coppiced in 19[illegible] and regeneration done in 1960).	1·58 (0·63)	1979	..
7	1937	(Coppiced in 19[illegible] and regeneration done in 1961).	1·96 (0·78)	1980	..
8	1938	(Coppiced in 1961 and regeneration done in 1962).	2·08 (0·84)	1981	..
9	1939	(To be felled in 1952 and to be regenerated in 1963).	2·57 (1·04)	1962	..
10	1940	(To be felled in 1963 and to be regenerated in 1964).	2·00 (0·81)	1963	..
11	1941	(To be felled in 1964 and to be regenerated in 1965).	3·01 (1·21)	1964	..
12	1942	(To be felled in 1965 and to be regenerated in 1966).	2·02 (0·82)	1965	..
13	1343	(To be felled in 1966 and to be regenerated in 1967).	2·28 (0·92)	1966	..
14	1943	(To be felled in 1967 and to be regenerated in 1968).	2·27 (0·92)	1967	..
15	1948	(To be felled in 1968 and to be regenerated in 1969).	2·00 (0·81)	1968	..
16	1944	(To be felled in 1969 and to be regenerated in 1970).	2·28 (0·92)	1969	..

Regeneration area or compartment number. (1)	*Year of formation.* (2)	*Area in acres (hectares).* (3)	*Year of final felling.* (4)	*Remarks.* (5)
17	1944 (To be felled in 1970 and to be regenerated in 1971).	2·29 (0·93)	1970	..
18	1945 (To be felled in 1971 and to be regenerated in 1972).	2·72 (0·92)	1971	..
19	1946 (To be felled in 1972 and to be regenerated in 1973).	1·54 (0·62)	1972	Three years' plantation to constitute one compartment as they are too small to from separate units.
	1947 (To be felled in 1972 and to be regenerated in 1973).	0·38 (0·15)	1972	
	1948 (To be felled in 1972 and to be regenerated in 1973).	1·38 (0·55)	1973	
20	1949 (To be felled in 1973 and to be regenerated in 1974).	1·70 (0·68)	1973	..

448. In the Odanthorai Series only clearfelling of 100 acres (40.47 hectares) of jungle growth is involved annually. As the discretion to select the annual regeneration area is left to the District Forest Officer, no tabular statement of fellings is necessary.

SECTION 7—REGULATION OF REGENERATION OPERATIONS.

449. *Burning.*—In the Hulikal Series no burning will be permitted in the felled areas as regeneration is partly by coppice. Slash disposal may present no big probelm, as intensive utilisation by the head load permit holders is anticipated.

450. In the Odanthorai Series soon after the contractor has vacated the coupe, the regrowth, if any, will be cut back and allowed to dry. The felling slash and cut materials will be evenly spread all over the area and burnt during February. The unburnt materials will be billeted, heaped and reburnt. The work will be completed by the 15th of March. Both these operations will be done under supervision. Due to paucity of growth only a patch burn may be possible.

451. *Formation of subsidiary canals.*—Irrigation by percolation will be adopted as the standard method. As huge areas have to be irrigated, the available water has to be utilised with the utmost economy. Water will be led along a minimum number of subsidiary channels taking off from the main canal and following an easy gradient on the ground. From the subsidiary channels, feeder canals will be formed to the extent necessary to reach all the plants at suitable intervals. This work will be completed by the end of March.

452. *Aligning and staking.*—The espacement will continue to be 8½ feet × 8½ feet (2.59 metres × 2.59 metres) as at present. On minor undulations where irrigation water cannot reach properly or on patches of poorer soil and of lower site quality, an espacement of 6 feet × 6 feet (1.83 metres × 1.83 metres) will be adopted. The aligning and staking should be completed by the 15th of April at the latest.

453. *Planting.*—The areas included in this working circle receive rains from both the monsoons, although the precipitation from the north-east monsoon is quantitatively more. Due to the receipt of both the monsoons, the phenology of teak in this area is such that it comes into leaf in April. As such planting must be done in May when the premonsoon showers are being received. Before planting, an area of 2 feet (.61 metre) radius around the plants will be scraped of all weeds. A couple of days before planting, weeds if any in the area will be scraped off and water be let out in the canals until the ground is properly wetted. One year old teak stumps about 10 inches (25.4 centimetres) long with 9 inches (22.86 centimetres) of root and 1 inch (2.5 centimetres) of shoot, and 0.4 to 0.8 inch (1 to 2 centimetres) thick at the collar prepared from nursery raised seedlings should be put in crow-bar holes made at each stake. The stumps should be planted firmly taking care to see that no air-space is left between the stumps and the soil.

454. Elevated patches unsuited for teak will be planted with naked plants of *Eucalyptus* hybrid. Similarly swampy localities may be planted with naked plants of *Eucalyptus rostrata* or stumps of *Karumarudu*.

455. Casualties of teak or miscellaneous species will be replaced as early as possible and completed by July ensuring full stocking in the area.

456. Original planting of teak or miscellaneous species will be done always on one definite side of the stake so that replacements can be done on the other.

SECTION 8—NURSERY.

457. Nurseries will be required for raising stumps of teak and *karumarudu* and seedlings of *Eucalyptus hybrid* and *Eucalyptus rostrata*. The nursery technique for *Eucalyptus* hybrid has already been discussed in detail under the chapter on Fuel Working Circle. The nursery technique for *Eucalyptus rostrata* will be the same as for *Eucalyptus* hybrid and therefore does not need any elaboration here. Seeds of both these species will be obtained from the State Silviculturist. The nursery technique for Teak and *Karumarudu* are described below.

458. *Seed collection and storage.*—Local seeds should be collected as far as possible. The older Hulikal plantations may be depended upon for this, but as the quantity of seeds obtained may not be adequate, this can be supplemented from seeds from Bolampatti Range or from Topslip. Since many of the characteristics of teak are probably hereditary, it is essential that seed should be collected only from trees of good, straight growth and form. Trees of twisted grain or of low branching habit should be rejected for seed collection. Trees of plantation origin should be preferred as they are generally straight grown and are of known age and better progeny.

459. The following table indicates the time for seed collection for the species suggested for planting :—

Serial number.	Name of the species.	Time of collection of seed.
(1)	(2)	(3)
1	Teak	January-February.
2	*Karumarudu*	February-March.

460. Seed may be conveniently collected by clearing the ground under the trees, and the branches lightly beaten off by means of long sticks.

461. The dry pericarp of the teak fruits should be removed soon after collection.

462. All the seeds should be dried and stored in gunnies under cover in airy rooms.

463. *Nursery site.*—The nursery site should be preferably formed in the regeneration area itself as against the present practice of having a permanent nursery. A temporary nursery has definite advantage over a permanent one by reducing the cost of transport of stumps besides reducing the damage by cockchafers. The number and quality of stumps produced would be also definitely superior owing to the virgin soil. The nursery site should have a good loamy soil. Clayey and very gravelly sites should be avoided as this will result in short, inferior and branchy stumps. All nursery sites should be approved by the District Forest Officer.

464. *Formation of beds.*—The nursery site should be cleared of all growth and stumps if any uprooted. The soil should be dug to a minimum depth of 18 inches (45.3 centimetres), the clods broken and the soil allowed to weather for a couple of months. Stones and pebbles if any should be carefully removed from the soil as these will result in bending of the roots. Standard beds of 40 feet × 4 feet (12.2 metres × 1·2 metres should be formed leaving an intervening space of 1½ feet (0.45 metre) to facilitate watering, weeding and inspection. The beds should be raised 9 inches (23 centimetres approximately) high supported at the sides by split bamboos, poles or other convenient material, so as to ensure good drainage. Beds should be laid along the contour and not across it. The surface of the beds should be given a slight camber to prevent stagnation of water. No shading of the beds will be normally required.

465. The formation of beds should be completed by the end of April at the latest.

466. *Size of nursery.*—One bed of standard size 40 feet × 4 feet (12.2 metres × 1.2 metres) is reckoned as sufficient for raising 1 acre (.40 hectare) of plantation of teak or *Karumarudu* as the case may be at an espacement of 6 feet × 6 feet (1.83 × 1.83 metres). A few additional beds should be formed to provide for replacement of casualties.

467. *Sowing.*—In order to ensure that fully stocked beds are obtained, dense sowing is advocated. 30 lb. (14 kilograms approximately) of seeds per bed would be sufficient for teak or *Karumarudu*.

468. No pretreatment before sowing is needed either for teak or for *Karumarudu.*

469. The seeds should be sown early in May and covered with a layer of fine soil to a depth equal to the thickness of the seed. The sowing must be done in separate beds for each of the species. The beds should then be covered with scattered twigs of *Nellikai* (*Emblica Officials*) or similar light leaved material and finally a layer of straw. The twings will prevent the straw being washed into the soil and facilitate removal of the straw without damaging the germinating seeds. As soon as germination is observed, the straw must be removed.

470. The beds should be watered regularly on non-rainy days until the onset of the monsoon.

471. *Weeding.*—The nursery beds should be kept clean weeded always and the soil loosened between plants now and then as necessary.

472. A most important thing in the raising of a teak nursery is the necessity to raise a well-stocked crop of seedlings of uniform height. In order to achieve this, it is very necessary to pluck off the few more robust seedlings which outgrow the rest and result in ' wolves '. These ' wolves ' if not removed completely suppress the rest of the seedlings, finally resulting at the end of the first year a nursery bed consisting of about a couple of hundred woody seedlings scattered over a mass of suppressed tiny seedlings thoroughly useless for the production of stumps.

473. *Preparation of stumps.*—Teak stumps with a diameter range of 0.4 to 0.8 inch (1 to 2 centimetres) at the collar give the best results both as regards survival percentage and growth. Two year old stumps can be also used provided they are within the diameter range prescribed above. The nursery beds should be watered before the seedlings are pulled out. Removed should begin at one end of the bed and proceed towards the other end. A sufficient number of seedlings should be left in the beds to stock the nursery site at an approximate espacement of 6 feet × 6 feet (1.83 metres × 1.83 metres). The seedlings should be removed one at a time, by holding them as near the ground as possible, and gently pulled. The bark of the tap-root should not be damaged while pulling. If assistance is required, a pick-axe should be used to loosen the soil, care being taken not to damage the roots of the seedlings.

474. In making stumps it is essential to use a sharp knife; all small side roots should be trimmed off flush with the main root and the stem should be cut off about one inch (2.5 centimetres) above the collar. Nine inches (23 centimetres approximately) of root should be left as per standard procedure.

SECTION 9—SUBSIDIARY SILVICULTURAL OPERATIONS.

475. *Watering.*—During the first year, watering will be done once in ten days by flood irrigation, care being taken to see that each plant gets sufficient wetting. The whole area will be flooded and water allowed to soak more than an hour: care being taken to see that the water reaches the individual plants. On minor undulations where gravity irrigation may not suitably work, the use of hoses or pot watering is suggested. For subsequent years the watering regime will be as follows :—

In the second year once in a fortnight.

In the third year once in a month.

In the fourth year once in 1½ months.

476. As to whether watering is needed beyond the fourth year, is an issue open for decision based on future observations.

477. The subsidiary and feeder canals will be cleared twice in the year and kept in an efficient state of functioning. The canals will be watched and maintained, bunds strengthened, breaches stopped and obstructions removed as and when necessary.

478. *Underplanting*.—Underplanting of *Daincha* or Camphor Tulsi will be done during the second year as at present. 3 feet (.91 metre) wide strips will be cleared in between the planting lines and seeds of these species sown in June. The lines will be kept weeded along with the Teak. *Daincha* seeds will be collected when mature for distribution to the ryots through the Agricultural Department. The question of distilling camphor from Tulsi leaves is now being investigated by the Cinchona Department and a decision on how best this could be done can be made after further study in collaboration with the Cinchona Department. The underplanting is expected to keep down the weeds and help in multiple use of the soil thereby ensuring increased productivity.

479. *Replacement of casualties*.—Casualties of teak or miscellaneous species will be replaced then and there so as to ensure full stocking in the area.

480. Casualties will be replaced during the second year also at the time of planting in the current year's regeneration area. Any elevated patches where teak had repeatedly failed despite replacements will be planted with *Eucalyptus hybrid*.

481. *Tending*—(*a*) *First year*.—Three knife weedings will be done during the first year. The first one will be done during June–July, the 2nd in October–November and the third in January–February. During the course of the first weeding, thorny species occurring all over the area will be uprooted.

482. Two soil workings to a radius of 2 feet (.61 metres) around the plants will be done during the first year. The first one will be done in September. The second soil working which will be confined to backward plants only will be done in December-January.

483. (*b*) *Second year*.—During the second year, 3 knife weedings will be done as in the first year. Only one soil working to a radius of 2 feet (.61 metres) will be done in September.

484. (*c*) *Third year*.—During the third year, only two knife weedings will be done. The first one will be done in June-July and the second in October-November. A scraping around the backward plants to a radius of 2 feet (0.61 metres) wil be done if necessary at the time of second weeding.

485. (*d*) *Fourth year*.—If necessary only one knife weeding will be done during the fourth year. This will be done in June–July. No soil working or scraping will be done.

486. Any weedings or tending for the fourth year and after in case of general backwardness of any plantation will be decided by the Conservator of Forests.

487. *Thinnings*.—The present thinning procedure that is being adopted in the Hulikal plantations is prescribed without effecting any changes as it has stood the test of time. Two thinnings at the age of 7 and 13 years is prescribed. The intensity of thinning adopted will be D grade.

488. The Hulikal Durg Reserved Forest is a very badly climber infested area. In the Odanthorai Reserved Forest too, climber infestation is heavy on account of the watering. A climber cutting and removal of *Pulluruvi* (*Dendrophthoe* species syn. *Loranthus*) or other parasites on the trees should precede every thinning, and the marking officer should ensure that these operations have been carried out properly before he commences marking.

489. The markings for the thinnings will be carried out by the District Forest Officer or his Gazetted Assistant if he is provided with one.

490. *Thinning programme.*—The following statement gives details of the areas to be thinned during the ten year period of this plan :—

Year of thinning.	*Name and year of the plantation or compartment.*	*Area* in acres.	*Area* (in hectares).
(1)	(2)	(3)	(4)
1963-64 ..	Hulikal Compartment 3	2·13	(0·86)
	Thattaipallam 1957-58	20·00	(8·09)
1964-65 ..	Hulikal compartment 4	2·33	(0·94)
	Odenthorai Regeneration Area 1958-59	113·00	(45·53)
1965-66 ..	Hulikal compartment 5	2·95	(1·19)
	Odanthurai Regeneration Area 1959-60	114·00	(46·14)
1966-67 ..	Hulikal compartment 6	1·58	(0·63)
	Odanthorai Regeneration Area 1960-61	100·00	(40·47)
1967-68 ..	Odanthorai Regeneration Area 1961-62	98·00	(39·66)
	Hulikal compartment 7	1·96	(0·79)
	(Regeneration Area) Hulikal compartment 1..	3·25	(1·31)
1968-69 ..	Hulikal compartment 8	2·08	(0·84)
	Hulikal compartment 2	2·13	(0·86)
	Odanthorai Regeneration Area 1962-63	100·00	(40·07)
	Thattaipallam Regeneration Area 1956-57	15·00	(6·07)
1969-70 ..	Hulikal compartment 9	2·57	(1·04)
	Odanthorai 1963-64	100·00	(40·47)
	Hulikal compartment 3	2·12	(0·86)
	Thattaipallam 1957-58	20·00	(8·09)
1970-71 ..	Hulikal compartment 10	2·00	(0·81)
	Hulikal compartment 4	2·33	(0·94)
	Odanthorai Regeneration Area 1964-65	100·00	(40·47)
	Odanthorai Regeneration Area 1958-59	113·00	(45·33)
1971-72 ..	Hulikal compartment 11	3·10	(1·25)
	Hulikal compartment 5	2·95	(1.19)
	Odanthorai Regeneration Area 1965-66	100·00	(40·47)
	Odanthorai Regeneration Area 1959-60	114·00	(46·14)
1972-73 ..	Hulikal compartment 12	2·30	(0·93)
	Hulikal compartment 6	1·58	(0·63)
	Odanthorai Regeneration 1966-67	100·00	(40·47)
	Odanthorai Regeneration 1960-61	100·00	(40·47)

491. The following thinning programme is laid down for the next five years, in case the revision of the plan is not taken up in time:—

1973-74 ..	Hulikal compartment 13	2·27	(0·92)
	Hulikal compartment 7	1·96	(0·78)
	Odanthurai Regeneration Area 1967-68	100·00	(40.47)
	Odanthorai Regeneration Area 1961-62	100·00	(40·47)
1974-75 ..	Hulikal compartment 14	2·27	(0·92)
	Hulikal compartment 8	2·08	(0·84)
	Odanthorai Regeneration Area 1968-69	100·00	(40·47)
	Odanthorai Regeneration Area 1962-63	98·00	(39·66)
1975-76 ..	Hulikal compartment 15	2·00	(0·81)
	Hulikal compartment 9	2·57	(1·04)
	Odanthorai Regeneration Area 1969-70	100·00	(40·47)
	Odanthorai Regeneration Area 1963-64	100.00	(40·47)
1976-77 ..	Hulikal compartment 16	2·28	(0.92)
	Hulikal compartment 10	2·00	(0·81)
	Odanthorai Regeneration Area 1970-71	100·00	(40·47)
	Odanthorai Regeneration Area 1964-65	100·00	(40·47)
1977-78 ..	Hulikal compartment 17	2·29	(0·93)
	Hulikal compartment 11	3·10	(1·25)
	Odanthorai Regeneration area 1971-72	100·00	(40·47)
	Odanthorai Regeneration area 1965-66	100·00	(40·47)

492. The thinning schedule prescribed will be followed strictly unless the District Forest Officer considers postponement owing to the backwardness of any plantation of such other special circumstances.

493. The thinned produce will be converted and disposed of by the same procedure as for final fellings in the Hulikal Series detailed in paragraph 440 to 443.

SECTION 10—OTHER REGULATIONS.

494. *Plantation boards.*—Every plantation should carry at the salient corners of its periphery, conspicuous plantation boards showing the calendar year of its formation and the area. Such of these boards that require replacement will be renewed in the month of April every year.

495. *Inspection paths.*—Permanent and graded paths 6 feet (1.83 metres) wide, will be laid out and kept clean of all growth every year so as to facilitate inspection. They may conveniently be laid in such mannner as to divide the plantation into equal number of parts.

496. *Fire protection.*—No special measures of fire protection are necessary. It is considered that the annual clearance of the inspection paths will be sufficient to keep out any chance fires.

497. *Closure to grazing.*—All the plantations raised under this circle will be closed to grazing indefinitely as they are extremely valuable.

498. *Demarcation.*—The actual area of each of the plantations that are formed during the period of this plan should be formed by actual survey of the planted area. Map of each plantation formed will be prepared on a scale of 16 inches to a mile (1 centimetre = 0.00396 kilometre) and filed in the plantation journal and the control journal so that it may be of use during the next revision of the plan.

499. *Kumri cultivation.*—Mention has already been made in paragraph 221 of Chapter V of the objection to *kumri* cultivation in the past in the Hulikal series by the lower riparian land owners. As the available water in both the series is insufficient for the forest crop alone amidst competition from the ryots in the ayacuts of the Halur Halla and Coonoor river, *kumri* cultivation is not prescribed.

500. *Staff.*—The existing staff is considered sufficient. No additional staff will be necessary.

SECTION 11—CONTROL.

501. A control journal, a control book, plantation and nursery journals, a record of works, and control maps will be maintained for this working circle. The manner in which these forms are to be maintained are indicated in sections 'M' and 'N' under the chapter on Miscellaneous Regulations.

CHAPTER VI—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

502. *General constitution.*—This working circle will include all the areas included by Mahmood Hussain in his Bamboo Working Circle without any change. It will comprise of all the Bamboo bearing areas in the Pilloor slopes, Hulikal Durg, Kallar, Aduthorai, Auduthorai Extension, Kallur, Jaccanare and Nilgiris Eastern slopes Reserved Forests of the Mettupalayam Range where bamboos are found in exploitable quantities. The working circle does not extend to Bhavani Range which is devoid of bamboos.

503. *Area.*—The total gross area of the working circle is 16,425.00 acres (6,646.33 hectares), which includes small patches devoid of bamboo also but which have been included in order to obtain convenient natural boundaries for purposes of management. The net bamboo bearing area has been estimated to be 15,295.00 acres (6,189.38 hectares).

504. *Character of the vegetation.*—The type of forest occurring within this working circle is a dry deciduous forest (Champion's type 4a/C2) a fuller description of which is given in Chapter II of Part I. Bamboos occur in this type of forest as an understorey to form a two storeyed high forest. *Kalmungil* is the predominant bamboo occurring within the tract, but a few clumps of *Perumungil* are also seen along the river banks in sheltered locations, but in the Kallar and Hulikal drug Reserves it occurs more plentifully.

Section 2—Division of the Area.

505. *Division into felling series.*—The working circle will consist of four felling series as at present, namely :—

(i) Hulikal Bamboo Felling Series;

(ii) Kallar Bamboo Felling Series;

(iii) Jaccanare Bamboo Felling Series; and

(iv) Ulliyur Bamboo Felling Series.

506. The following statement gives a description of the boundaries of the felling series :—

Serial number and name of the felling series.	*Area in acres (hectares).*				*Boundaries.*
	Total.		*Effective.*		
(1)	(2)		(3)		(4)
1 Hulikal (Portion of series comprising Coupe I).	912·00	(369·07)	862·00	(348.34)	The catchment areas of Chengalpallam, Pillurpallam and Kadambakombaipallam.
Hulikal (Portion of series comprising of Coupes II and III).	2,291·00	(846·20)	2,131·00	(862·39)	*North.*—The Coonoor Pallam; *east and south.*—Reserved Forest boundary between Hulikal durg and Nellithorai Reserved Forests and *west.*—Stream from Ponnaraikombai joining Bhavani River near Sottayur (also Revenue District boundary).
2 Kallar	1,855·00	(750·69)	1,735·00	(702·13)	*North.*—Hadathorai Halla, *east.*—Hadathorai Halla and Kallar Reserved Forest boundary; *south.*—Coonoor pallam (which is also the boundary of Kallar Reserved Forest) and *west.*—Division boundary.
3 Jaccanare	6,613·00	(2,675·00)	6,113·00	(2,473·78)	Entire Jaccanare slopes Reserved Forest and entire portion of Kallur Reserved Forest lying within the Mettupalayam Range.
4 Ulliyur (Portion) (Coupes I-a, II and III).	4,403·00	(1,781·84)	4,153·00	(1,680·87)	*North.*—Division boundary and ridge to Yemmehatti betta (3587 feet); thence along the Yemmehatti betta-Velamundi Chatram foot-path up to the point where the footpath to Patramangalam deviates; *east.*—Yemme hatti betta-Patramangalam footpath up to △ 1,610 thence along the ridge up to Arasanmokkai △ 2,430 and thence along the stream to Thattaipallam via △ 1,140 and △ 1,620 *south.*—The Thattaipallam and footpath to Allur; thence along the footpath up to Halur Halla and thence along the Halur Halla, and *west.*—Division boundary.

Serial number and name of the felling series. (1)	Area in acres (hectares). Total. (2)		Effective. (3)		Boundaries. (4)
Ulliyur (Portion) (Coupe I-b).	351·00	(142·04)	301·00	(121·87)	*North.*—Uppupallam, *east.*—Stream from a hill between △1,570 and △1,770 flowing west of Marigudi, *south.*—Footpath from Pudur to Patramangalam, via △2,500 and △ 1,770, *west.*—Division boundary.

SECTION 3—ANALYSIS AND VALUATION OF THE CROP.

507. No detailed analysis of the crop was made as it was not considered necessary.

508. No fresh stockmapping of the areas to be included in this working circle were made as it was considered sufficient to rely on the stock maps of the previous plan which were prepared only six years ago.

SECTION 4—METHOD OF TREATMENT.

509. *System of management.*—The system of management adopted in this working circle may be defined as ' Selection thinning of bamboo clumps '.

510. *Felling cycle.*—A felling cycle of three years is prescribed as in the past plan. This is the period generally adopted for working bamboos in the State.

511. *Regulation of the yield.*—The yield will be regulated by area. In each felling series, therefore, the size of the annual coupe is obtained by dividing the total area by the felling cycle. The coupes in the felling series have been constituted according to the effective area under bamboos in each coupe but to a greater extent depending on the topographical features of the country over which the bamboos lie scattered. The boundaries of the coupes thus constituted are the same as those in Mahmood Hussain's plan.

SECTION 5—METHOD OF EXECUTING FELLINGS.

512. *Agency of exploitation.*—The fellings will be made through the agency of contractors, by selling the coupes prescribed for the year in open auction.

513. *Period of contract.*—The lease period will be one year for each coupe and will be concurrent with the fiscal year. Each annual coupe will form a separate lease unit.

514. *Felling rules.*—The following felling rules are prescribed :—

(i) A minimum of six mature culms should be left in each clump ; a culm will be considered mature, if it is at least one year old;

(ii) No culm which is less than a year old shall be felled ;

(iii) No culm shall be removed with the rhizome ;

(iv) Culms shall be cut clean and as low as possible but not below the first node from ground level;

(v) Fellings shall be made as far as possible on the side of the clump opposite to that from which the largest number of new culms spring up;

(vi) Top or bottom pieces of culms unwanted by contractors will not be left hanging within the clump as they will cause clump congestion and possible crown fires. These should be extracted from the clump and left lying on the forest floor, if not required by the contractor; and

(vii) Bamboos in a fuel coupe under working will be the property of the fuel coupe contractor and not of the bamboo coupe contractor. The fellings will however strictly conform to the Bamboo Felling Rules.

515. *Supply of local demand.*—The bamboo coupe contractor shall at all times during the period of his contract sell to ryots on demand for their bona fide and domestic agricultural purposes, bamboos at such rates as may be fixed by the District Forest Officer in consultation with the Collector.

516. The contractor shall also be bound to supply to the Basket-makers' Co-operative Societies their requirements of bamboos (not splits) at such rates as may be fixed by the Government from time to time.

SECTION 6—TABULAR STATEMENT OF FELLINGS.

517. The details regarding the three coupes that have been constituted and their years of exploitation during the period of this plan are shown in the following statement.

518. Coupes which are to be worked during the succeeding five years are also indicated so that there may be no break in the continuity of controlled working in case the revision of this plan is not taken in time.

Year of working.	*Name and number of coupe.*	*Area of the coupe in acres (hectares).*		*Boundaries.*
		Total.	*Effective.*	
(1)	(2)	(3)	(4)	(5)
1963–64 1966–67 1969–70 1972–73 1975–76 1978–79	Hulikal Bamboo Coupe I.	912·00 (369·07)	862·00 (348·84)	The catchment areas of Chengalpallam, Pillurpallam and Kadambakombai pallam in Pillur slopes Reserved Forest (4 Bits).
1964–65 1967–68 1970–71 1973–74 1976–77	Hulikal Bamboo Coupe II.	1,453·00 (588·01)	1,353·00 (574·54)	*North.*—A ridge running east to west along △ 3,460 from the western boundary of the Hulikaldurg Reserved Forest to a main stream running from △ 3,460 north of Nellur up to the common boundary between Hulikaldurg and Nellithorai Reserved Forests; *east and south.*—The common boundary between Nellithorai and Hulikaldurg Reserved Forests; *west.*—A stream running from Ponnarakombai to join the Bhavani near Sottaiyur (also division boundary).
1965–66 1968–69 1971–72 1974–75 1977–78	Hulikal Bamboo Coupe III.	838·00 (339·13)	778·00 (314·85)	*North.*—The Coonoor pallam; *east.*—Eastern boundary of Hulikal Durg Reserved Forest; *south.*—Northern boundary of coupe II; *west.*—Division boundary up to the starting point.
1963–64 1966–67 1969–70 1972–73 1975–76 1978–79	Kallar Bamboo Coupe I.	490·00 (198·30)	450·00 (182·11)	*North.*—Hadathorai Halla forming Reserved Forest boundary (also division boundary); *east.*—Kallar pallam; *south.*—Railway line up to the point where it meets the footpath to Mutri Estate, and thence along the said footpath; *west.*—The said footpath until it meets the Reserved Forest boundary (also division boundary).
1964–65 1967–68 1970–71 1973–74 1976–77	Kallar Bamboo Coupe II.	685·00 (277·21)	645·00 (261·02)	*North.*—Kallar Reserved Forest boundary and the Railway line and along southern boundary of Coupe I (Railway line upto Kallar pallam); *east.*—Reserved Forest boundary of Kallar Reserved Forest till it meets the Mettupalayam–Ootacamund road; *south.*—Kallar Reserved Forest boundary till it meets the Coonoor pallam and thence along the said pallam; *west.*—Division boundary (Kallar Reserved (Forest) boundary).

Year of working.	*Name and number of coups.*	*Area of the coupe in acres (hectares).* *Total.*	*Effective*	*Boundaries.*
(1)	(2)	(3)	(4)	(5)
1965–66 1968–69 1971–72 1974–75 1977–78	Kallar Bamboo Coupe III.	680·00 (275·19)	640·00 (259·00)	*North.*—Mutri Estate–Marikode footpath; *east and south.*—The above said footpath upto Railway line and along the railway line till it meets Kallar Reserved Forest Boundary; *west.*—Division boundary [Reserve Forest boundaries of Kallar and Aduthorai Reserves] up to starting point.
1963–64 1966–67 1969–70 1972–73 1975–76 1978–79	Jaccanare Bamboo Coupe I (Part).	1,613·00 (652·76)	1,503·00 (608·24)	*North.*—Northern boundary of Jaccanare slopes Reserved Forest up to starting point; *east.*—Along the above said Reserved Forest boundary and thence along stream running from Vellarikombai up to the southern boundary of Jaccanare Slopes Reserved Forest; *south.*—Southern boundary of Jaccanare slopes Reserved Forest (up to Kallarpallam); *west.*—The Kallarpallam (forming Jaccanare slopes Reserved Forest boundary) up to the starting point.
1963–64 1966–67 1969–70 1972–73 1975–76	Jaccanare Bamboo Coupe I (Part).	245·00 (99·14)	205·00 (82·96)	The whole of Kallur Reserved Forest lying within Coimbatore Central Forest Division.
1964–65 1967–68 1970–71 1973–74 1976–77	Jaccanare Bamboo Coupe II.	2,195·00 (888·29)	2,045·00 (227·59)	*North.*—Northern boundary of Jaccanare slopes Reserved Forest until it meets the Mettupalayam–Kotagiri road near Kunjapanai at △ 3,149 and thence along the said road up to △ 2,458; *east.*—Along the said road up to the southern boundary of Jaccanare slopes Reserved Forest; *south.*—Southern boundary of Jaccanare slopes Reserved Forest up to eastern boundary of coupe I; *west.*—A stream running from Vellarikombai up to the Southern boundary of Jaccanare slopes Reserved Forest (eastern boundary of coupe No. I).
1965–66 1968–69 1971–72 1974–75 1977–78	Jaccanare Bamboo Coupe III.	2,560·00 (1,036·00)	2,360·00 (356·07)	*North.*—Aduthorai Halla (Northern boundary of Jaccanare slopes Reserved Forest); *east.*—Reserved Forest boundary of Jaccanare slopes Reserved Forest up to Mettupalayam–Kotagiri road; *west.*—Mettupalayam–Kotagiri Road till Reserved Forest boundary of Jaccanare slopes Reserved Forest (Division boundary) up to the starting point.
1963–64 1966–67 1969–70 1972–73 1975–76 1978–79	Ulliyur Bamboo Coupe I-a.	2,284·00 (924·31)	2,204·00 (891·94)	*North.*—Division boundary and thence along the Yemmehatti–Velamundy Chatram footpath up to the point where the footpath to Patramangalam deviates; *east.*—Along the said footpath to Patramangalam; thence

Year of working.	*Name and number of coupe.*	*Area of the coupe in acres (hectares).* *Total.*		*Effective.*		*Boundaries.*
(1)	(2)	(3)		(4)		(5)
						along the ridge to Arasanmokkai at △ 2,430 and thence along the streamlet from Arasanmokkai to Thattaipallam along △ 1,4 0 and △ 1,020 ; *south.*—Along the Thattaipallam till it meets the Kullankeraipallam; *west.*—Along the Kullankeraipallam (North and eastern boundary of Bamboo Coupe II up to the starting point.
1963–64 1966–67 1969–70 1972–73 1975–76 1978–79	Ulliyur Bamboo Coupe I-b.	351·00	(142·04)	301·00	(121·81)	*North.*—Uppupallam; *east.*—Stream from a hill flowing from Singamalai and joining the Uppupallam; *south.*—Footpath from Pudur to Patramangalam, via △ 2,500 and △ 1,720 *west.*—Division boundary.
1964–65 1967–68 1970–71 1973–74 1976–77	Ulliyur Bamboo Coupe II.	1,461·00	(591·25)	1,361·00	(550·78)	*North and east.*—Division boundary till it meets Kullankeraipallam thence along the Kullankeraipallam, via △ 1,840, △ 1,370 and △ 1,120 till it meets Thattaippallam; *south.*—Along the Thattaippallam up to the junction of the Gandai-Kilkotagiri and Hallur-Kilkotagiri footpaths and thence along the Gandai-Kilkotagiri footpath till it meets the division boundary; *west.*—Division boundary up to starting point.
1965–66 1968–69 1971–72 1974–75 1977–78	Ulliyur Bamboo Coupe III.	650·00	(263·05)	588·00	(237·96)	*North and east.*—Division boundary till it meets the Kilkotagiri footpath up to Halur halla; *south.*—Thence along the Halur halla up to Division boundary; *west.*—The Division boundary up to starting point.

SECTION 7—OTHER REGULATIONS.

519. *Grazing.*—The forests included in this working circle will be open to grazing.

520. *Fire protection.*—The working circle will be protected from fire under the prescriptions for general fire protection contained in sections M and N of the chapter on Miscellaneous Regulations.

SECTION 8—CONTROL.

521. *Record of statistics.*—A monthly account of all removals of bamboos shall be rendered to the Range Officer by the lessee not later than the 10th of the subsequent month. Details must be furnished showing the outturn and removals under the different local classes of bamboos, the rates charged by the contractor for each class and current sale rates.

522. The Range Officer will send a monthly abstract of these accounts for each coupe in the range to the District Forest Officer so as to reach him by the 20th of the same month for incorporation in the control records and the timber registers.

523. Bamboos extracted departmentally will be taken to stock and accounted for as required by the Forest Code.

524. *Control.*—A control book, control journal and record of works will be maintained for this working circle. The manner in which these forms are to be maintained are indicated in sections M and N under the chapter on Miscellaneous Regulations.

525. *Flowering of bamboos.*—Special mention should be made in the control journal when any general flowering of bamboos is noticed in any particular locality or localities in the region.

CHAPTER VII—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE.

526. The Minor Forest Produce Working Circle will cover all the forests under the control of the Forest Department in the region. The prescriptions framed herein will apply to the farming of all the minor forest produce occurring within the working circle, with the exception of bamboos which have been dealt separately.

SECTION 2—ANALYSIS AND VALUATION OF THE CROP.

527. The chief items of minor forest produce which occur in the area are :—

	English or Tamil name.	Botanical name of species.	Portion used.
	(1)	(2)	(3)
1	Aloe	*Agave americana*	Fibre.
2	*Athikai*	*Ficus* species	Fruits.
3	*Avaram* bark	*Cassia auriculata*	Bark.
4	Bees wax	..	..
5	Cashew	*Anacardium occidentale*	Nuts and apples.
6	Clearing nut or *Thethan-kottai.*	*Strychnos potatorum*	Seeds.
7	Curry leaves	*Murraya koenigii*	Leaves.
8	Cut stone	..	..
9	Deer horns	..	..
10	*Eacham* grass	*Phoenix acaulis*	Leaves.
11	*Elandai*	*Zizyphus mauratiana*	Fruits.
12	Fodder grass	Several species	Entire plant.
13	Gall nut	*Terminalia chebula*	Fruits.
14	Gravel	..	..
15	Gum kino	*Pterocarpus marsupium*	Gum.
16	Honey	..	..
17	*Indukodi*	*Acacia intsia*	Bark.
18	*Indunar*	*Acacia intsia*	Fibre.
19	*Kathalai*	*Agave* species	Fibre.
20	*Kilakkai*	*Carissa carandas*	Fruit.
21	*Konnai* bark	*Cassia fistula*	Bark.
22	*Korai* grass	*Cyperus rotundus*	Stem
23	*Kundumani*	*Abrus precatorius*	Seeds.
24	Lemon grass	*Cymbopogon* species	Leaves and stem.
25	*Malamanjadi*	*Ormosia travancorica*	Roots.
26	*Mahali kilangu*	*Gymnema montanum*	Root tuber.
27	*Mohwa*	*Madhuca latifolia* and *Madhuca longifolia.*	Flowers and seeds.
28	*Nannariver*	*Hemidesmus indicus*	Roots.
29	Neem seeds	*Azadirachta indica*	Seeds.
30	*Nellikai*	*Emblica officinalis*	Fruits.
31	*Nuxvomica*	*Strychnos nuxvomica*	Seeds

	English or Tamil name.	Botanical name of species.	Portion used.
	(1)	(2)	(3)
32	*Odankodi*	*Hippocratea indica*	Stem.
33	Palmyra	*Borassus flabellifer*	Leaves.
34	*Poochakottai*	*Sapindus emarginatus*	Fruit.
35	*Pungam* seeds	*Pongamia pinnata*	Seeds.
36	Sambhur horns	—	
37	Screwpine flowers	*Pandanus* species	Inflorescence.
38	*Shekoy*	*Acacia concinna*	Fruit.
39	Stone-moss	—	..
40	*Sundakai*	*Solanum trilobatum*	Fruit.
41	Tamarind	*Tamarindus indica*	Fruit.
42	*Thanikai*	*Terminalia belerica*	Fruit.
43	*Vembadam*	*Ventilago madraspatana*	Bark.
44	Wild mangoes	*Mangifera indica*	Fruit.
45	Wood apple	*Feronia limonia*	Fruit.

Section 3—Division of the Area.

528. As in the previous plan, the Mettupalayam Range has been constituted as one unit of sale, but the Bhavani Range is divided into two units as the Velamundy forests are quite separated from the rest of the areas in Erode taluk. Wherever a particular produce exists in sufficient quantities, or where the produce involved invites bidders who are not ordinarily interested in other items of minor forest produce, e.g. Gall nuts, usufructs of palmyra, *Avaram* and *Konnai* bark, etc., they are put up for sale separately. The units of sale are noted in the statement below :—

Units of sale.	*Nature of produce.*	*Description of farm and locality.*	*Remarks.*
(1)	(2)	(3)	(4)
	(a) Mettupalayam Range.		
1	All minor forest produce except Gallnuts, *Konnai* bark, Honey, Bees-wax, stone, gravel, ivory, deer and sambhur horns.	Entire range excluding hill tribe settlements and area handed over to the Kallar Fruit garden.	
2	Gall-nuts	Do.	
3	*Konnai* bark	Do.	To be leased out once in three years only.
4	*Avaram* bark	Do.	
	(b) Bhavani Range.		
5	*Avaram* bark	Velamundy Reserved Forest.	..
6	*Avaram* bark	All the reserves in Erode taluk.	..
7	Usufructs of Tamarind trees	Do.	..
8	Usufructs of Palmyra trees	Do.	..
9	*Sundakkai*	Do.	..

Section 4—Method of Treatment.

529. *Agency of exploitation.*—All minor forest produce other than stone and gravel, honey and bees-wax, ivory, deer and sambhur horns and valuable remains of dead animals will be exploited through the agency of contractors. The right to collect the produce will be leased out annually by sale in open auction.

530. Honey and bees-wax are now being collected by the department and sent to the Forest Utilisation Officer, Madras, for processing and sale. The existing practice will be continued.

531. Ivory, deer and sambhur norns and the valuable remains of dead animals will be collected departmentally in the interests of preservation of wild life, because contractors may not necessarily confine their collection to these horns found fallen on the forest floor.

532. Stone and gravel will be sold on demand at seigniorage rates to the desirous public from the existing quarries within the reserves. The following are the seigniorage rates approved by the Government for such removals :—

	RS.	P.	
Rough stone	1	87	per 100 cubic feet (2·8 cubic metres).
Chiselled stone ..	3	75	Do.
Metal and gravel ..	0	75	Do.
Earth and turf ..	0	47	Do.

533. In cases of demand, fresh quarries may be opened by the District Forest Officer in such places where there is no growth so that no detriment is caused to the forests. It is however prescribed that the area of the quarry-site should be demarcated on the ground and specified on the seigniorage permit by the District Forest Officer in order to prevent quarrying all over the place.

534. *Period of lease.*—All minor forest produce sale units except tamarind, *avaram* bark, gall-nuts and *sundakkai* will be leased out for the fasli year from 1st July to 30th June.

535. In the case of tamarind, the lease period will be for six months from 1st January to 30th June.

536. For *sundakkai* also the lease period will be six months but the period shall extend from 1st October to the 31st of March.

537. In the case of *avaram* bark, the lease period will be the financial year from 1st April to 31st March.

538. In respect of gall-nuts, the period of lease will be from 1st August to 30th Aprii.

539. *Konnai* bark will be leased out once in three years as per the existing practice. Since this unit was sold last in 1960–61, it has to be therefore leased out next during the years 1963–64, 1966–67 and 1969–72 for the period of this plan.

540. *Auction sales.*—Auction sales will be held between the 15th of May and the 15th of June for all items of minor forest produce except *avaram* bark. In the case of *Avaram* bark, the auction will be held between the 15th of February and the 15th of March. In the case of tamarind, the sales will be held between the 1st of November to the 15th of November. For *sundakkai,* the sales will be held between the 1st of September to the 15th of September. In case the prices obtained at the sales are not satisfactory, it is suggested that tenders may be called for by the District Forest Officer.

SECTION 5—SUBSIDIARY SILVICULTURAL OPERATIONS.

541. *Planting of tamarind.*—Provision has already been made to plant tamarind on a large scale while regenerating felled fuel coupes and degraded areas as tamarind fruits are in short supply owing to indiscriminate felling of trees on private lands. This is perhaps the only way of increasing the proportion of this valuable species in areas earmarked for fuel working also.

542. It is also prescribed that the beat subordinate should annually plant up at least 20 tamarind plants at an espacement of 40 feet (12 metres approximately) on either side of all forest roads in their region. The planted seedlings apart from their future value as minor forest produce yielders will serve as shade trees also.

543. Pot plants of tamarind about two years old should be planted during the south-west monsoon rains in 1 foot (.31 metre) cube pits dug and kept ready at the espacement referred to above. The plants will be weeded regularly and the soil worked to a depth of four to six inches (ten to fifteen centimetres approximately) around the plants.

twice during the first year of planting. The weedings and soil working should be repeated during the second year when it is expected that the plants will get established. Casualties, if any, should be replaced. The details of nursery technique will be the same as prescribed in the Fuel Working Circle.

544. *Planting of shekoy.*—Apart from tamarind, *shekoy* is another important minor forest produce whose production needs expansion. As matters stand, the pods of *Acacia concinna* are the only source of *shekoy*. *Shekoy* powder has been used instead of soap universally in South India from times immemorial for scrubbing of oil smeared over the body. Age-old customs as this die very hard, and it is quite certain that *shekoy* as a commodity will have a good demand for a long time to come. Artificial regeneration measures are therefore suggested to increase the production of this commodity. This has not been tried anywhere in the State so far and with the silvicultural behaviour of the species not quite known, trials should be made on a small scale to start with and the regeneration technique perfected in due course.

545. To start with, artificial regeneration work will be done on a small-scale at an annual rate of 5 acres (2.02 hectares) in the Mettupalayam Range. An area of 5 acres (2.02 hectares) will be demarcated annually in any one of the two fuel coupes in the Mettupalayam Range which are to be regenerated with fuel species. Seeds of *shekoy* will be sown during the south-west monsoon along lines aligned 11 feet (3.35 metres) apart instead of seeds of fuel species. Sowing is prescribed instead of using pot plants as *Acacia* species generally do not respond to transplanting. Fresh sowing will be done in the ungerminated gaps during the north-east monsoon. Planting of pot plants of fuel species 11 feet (3.35 feets) apart along each planting line, and planting of tamarind at an overlapping espacement of 30 feet × 30 feet (9.14 metres × 9.14 metres) as per the prescriptions of the Fuel Working Circle will be carried out as the intention is to raise *shekoy* only as an understorey to the fuel crop.

546. Three weedings combined with soil working during the first year and two during the second year will be done along the lines as per the prescriptions of the Fuel Working Circle.

547. The results will be watched carefully and any changes in the regeneration technique arrived after consulting the State Silviculturist. If the results of planting are successful, the question of raising regular *shekoy* farms in the Mettupalayam Range may be considered.

548. *Planting of palmyras.*—In the dry areas of Erode taluk, the palmyra is a natural tree and should therefore come up well if planted artificially. It is easy to propagate, its maintenance costs practically nil, and if established should serve as a valuable source of minor forest produce and employment to the indigenous tapping population. It is suggested that one row of palmyras should be raised all along the boundaries of the ex-panchayat forests in Erode taluk. Apart from being useful minor forest produce yielders for years, the trees will serve as a permanent demarcation to these tiny reserves which are surrounded all round by *patta* lands. It is suggested that a length of 10 chains be planted every year in each beat until the entire boundary of each reserve is planted up.

549. The technique of raising palmyras will be in accordance with the prevailing practice adopted by the local villagers. It is well understood locally, but is however briefly described below.

550. The palymra nut annually ripens in September. Each fruit has one to three seeds and it is these seeds which are sown. The ripe fruit is collected and stored in village manure pits for a week or ten days in order to soften the fibrous pericarp to facilitate the removal of the seeds. Seeds may be purchased locally from the villagers. Local prices vary from Rs. 15 to Rs. 20 per 1,000. After rejecting the immature, insect attacked and apparently light seeds, the good ones should be dumped evenly on heaps in a convenient place adjacent to the planting site.

551. The dibbling will be done along the inner side of the reserve forest boundary at an espacement of 6 feet (1.83 metres). Pits one foot (.31 metre) will be dug at each planting spot. One seed will be dibbled in each pit and the pits refilled with the dug out earth. It is important that the dibbling of seeds is done early in October along with the first north-east monsoon showers, as late sowings are likely to result in failures. The cost of dibbling including purchase of seeds for a length of 10 chains is expected to be Rs. 5

SECTION 6—CONTROL.

552. The following control forms should be maintained and posted by the District Forest Officer before the end of each financial year :—

(1) Control book;

(2) Record of works;

(3) Plantation and nursery ledgers; and

(4) Control journal.

553. The manner in which these records are to be maintained are detailed in sections 'M' and 'N' under the chapter on Miscellaneous Regulations.

CHAPTER VIII—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

SECTION 1—GENERAL CONSTITUTION OF THE WORKING CIRCLE.

554. This working circle will include all the reserved forests in the region, except such areas as will be closed to grazing for silvicultural or other reasons.

555. The areas closed to grazing will fall under the following main categories, namely :—

(i) Areas closed for specified periods under the provisions of the plan;

(ii) Are as temporarily closed to grazing under the provisions contained in the Madras Forest Manual as a punitive measure in cases of unauthorized and wanton burning by the people of the locality.

556. *Closure for silvicultural reasons.*—Temporary or permanent closure to grazing will be applied for silvicultural reasons as follows :—

(1) All coupes of the Fuel Working Circle will be closed for a period of six years including the year of coupe working in view of the regeneration operations prescribed therein.

(2) All plantations raised under the prescriptions of the Rehabilitation Working Circle and all miscellaneous fuel plantations raised prior to the commencement of the prescriptions of the plan will be closed for a period of five years including the year of formation.

557. It will be however left to the discretion of the District Forest Officer to open all regeneration sites earlier than the prescribed period of five years in case of quicker and it will be equally obligatory for him to extend the closure for a longer period in case of poor growth or any other inforeseen reasons.

558. In all such cases the District Forest Officer will obtain the prior concurrence of the Conservator of Forests.

559. All plantations raised under the Irrigated Teak Plantation Working Circle will be permanently closed to grazing in view of their economic importance. Apart from the usual disadvantage of heavy grazing, trampling will not only disturb the irrigation network within the plantations but also likely to create other problems such as soil erosion.

560. Fodder and grass plots raised in the past under the Five-Year Plan Scheme "Reclamation of eroded areas for development of fodder and posture" will be closed to grazing for a period of two or three years until the area is fully stocked with grass.

561. All areas where experiments or research are conducted will be completely closed to grazing for certain specified periods as may be fixed by the State Silviculturist or the District Forest Officer from time to time.

562. *Closure as a punitive measure.*—Areas subject to incendiarism may be also closed to grazing subject to the condition that the aggregate of the area so closed at a time does not exceed 500 acres (202.34 hectares) in one particular locality and provided that the District Forest Officer submits a report to that effect to the Collector and to the Chief Conservator of Forests through the Conservator of Forests. This course will be adopted as a punitive measure only when the District Forest Officer considers that the damage to the growth is severe as to warrant closure to grazing even on silvicultural grounds. Such closure should in any case follow swiftly after the fire, so that it may have the maximum effect.

SECTION 2—METHOD OF TREATMENT.

563. *Regulation of grazing fees.*—Grazing will be regulated by the issue of permits printed in accordance with the provisions contained in the Madras Forest Manual. The following domestic animals may be licensed to graze, the existing fees being levied for all the areas in the range :—

Description of animals.	*Rate per head.* RS.	P.
Sheep	0	12
Cows, bulls, asses and horses	0	25
Buffaloes	0	50
Elephants	5	00

564. Calves aged below six months and accompanying its mother but not driven independently will be allowed to graze free. Calves admitted at the beginning of the year as being six months old, should pay half rates for the second-half of the year, beginning from the 1st of January.

565. Goats will on no account be licensed to browse or admitted into any of the reserves.

566. *Grazing possibility.*—A maximum grazing incidence of 5 acres (2.02 hectares) per cow unit is prescribed for all the reserves. In calculating this incidence, areas closed to grazing for silvicultural or other reasons will be excluded. Where the demand for permits exceeds this incidence, preference in the issue of permits should be given to the cattle in the village adjoining the forest provided permits are purchased within the first month of the grazing year.

567. *Grazing unit.*—The whole of the Coimbatore Central Forest Division will form one grazing unit. A grazing permit issued by the Range Officer, Mettupalayam or Bhavani, will be therefore valid throughout the division for the entire fasli year starting from the 1st of July and extending to the 30th of June. However, in actual practice, cattle from one range are seldom taken to another range for grazing and it will be therefore convenient for contol purposes to make the range as the unit of grazing revenue collection for purposes of statistics.

568. *Agency for collecting grazing revenues.*—The grazing fees will be collected departmentally as per the practice followed all over the State. The permits will be issued by the Range Officer and the concerned Section Foresters. Payment of permits must be made only to these officers either directly or by money order.

569. *Fodder grass.*—This item will continue to be leased out for commercial purposes along with other minor forest produce. However cutting and removal of grass in head-loads by the public for bona fide domestic purposes and by co-operative milk-supply unions and societies for the manufacture of silage will be permitted from the reserved forests except from coupes under felling or areas which are closed to grass cutting for silvicultural or other reasons. This concession was originally sanctioned in G.O. Ms. No. 227, Development, dated 26th January 1936, in accordance with the recommendations of the Royal Commission on Agriculture in 1929, and modified from time to time. The removal of fodder grass free from the reserved forests will be under the following conditions and will be governed by the orders in force from time to time.

(i) Removals will be allowed only in head-loads for bona fide use and for the use of the Co-operative Milk Supply Unions and Societies. Removals in cart loads will not be permitted. Removals for purposes of sale will be strictly prohibited.

(ii) Removals may be made throughout the year, but they shall not be made before dawn or dusk.

(iii) No permits will be required. It is considered that the introduction of permits may result in malafide practices by the subordinates.

(iv) Only long grass shall be cut; it shall not be uprooted. Only sickles shall be used. Bill hooks and felling axes shall not be carried.

(v) No forest produce shall be cut to stiffen or tie the bundles.

(vi) Removals shall be made only through recognized footpaths or roads which will be notified in the District Gazette.

(vii) The headloads of grass should be presented for inspection when demanded by a Forest Officer.

(viii) The grass shall not be set fire to either wilfully or negligently and no combustible material shall be taken into the forest, if fire breaks out the grass cutters shall make every endeavour to extinguish it.

(ix) The concession is liable to be withdrawn for serious breach of any of the conditions mentioned above or in the event of the occurrence of any serious fire, under the orders of the District Forest Officer who shall report the fact to the Collector for approval within ten days.

570. *Penning.*—Penning cattle within the reserved forests will be allowed between the 1st of July and the 31st of December. Penning helps to distribute the incidence of grazing evenly over the whole range and should therefore be encouraged.

571. Parties desirous of utilizing pens will obtain penning license which will be issued by the Range Officer in accordance with the orders in force.

572. A list of cattle pens now in use in the Mettupalayam Range is given below. There are no cattle pens in the Bhavani Range.

List of cattle pens in the Mettupalayam Range.

Serial number and name of the pen. (1)	Name of beat in which the pen lies. (2)	Name of perennial water source adjacent to the pen. (3)
1 Korapathi	Manar beat	Manar river.
2 Kunukkumaduvu ..	Odanthorai beat ..	Halur Halla.
3 Kanakathorai ..	Patramangalam beat..	Moyar.
4 Gathekadu ..	Manar beat	Kundah river.
5 Kuriattu Mottai ..	Koothamundi beat ..	Thattai pallam.
6 Verthorai	Patramangalam ..	Moyar.

573. Fresh pens may be opened by the District Forest Officer wherever he considers it feasible, if there is a demand from the local populace, but these shall be outside the limits of the Fuel and Rehabilitation Working Circles.

574. *Rotational or deferred grazing.*—No schemes for rotational or deferred grazing are prescribed as their practical application has proved to be a failure all over the State.

SECTION 3—OTHER REGULATIONS.

575. *Grazing notification.*—A notification will be published in the District Gazette every year in the month of May specifying the areas closed to grazing, and the conditions under which free removal of fodder grass will be permitted in the different parts of the range.

576. *Demarcation of closed areas.*—All areas closed to grazing will be marked on the ground by means of red sign boards written in Tamil and in English at as many salient points as may be necessary.

SECTION 4—CONTROL.

577. The following control forms will be maintained by the District Forest Officer in the manner as prescribed in sections M and N under the chapter on Miscellaneous Regulations and should be posted before the close of each financial year :—

(i) Control book.

(ii) Control journal.

(iii) Control maps.

578. The control maps should clearly show the areas closed to grazing and the penning sites commonly used.

CHAPTER IX—MISCELLANEOUS REGULATIONS.

579. There are a number of prescriptions which cannot be treated under any of the previous working circles as they are mostly on minor subjects which do not merit the formation of separate working circles. These are detailed in this chapter.

SECTION A—VILLAGE SANDAL WORKING.

580. *General constitution.*—The unreserves and *patta* fields containing sandal trees in the Mettupalayam Range over which Government have any right fall within the scope of this section. There are no areas containing sandal in the Bhavani Range.

581. Details of villages in the Mettupalayam Range containing sandal are given below :—

Name of the village.	*Survey field number.*	*Total area of the survey field in*		*Number of fields containing sandal.*	*Area of fields containing sandal in*	
		Acres.	*(Hectares).*		*Acres.*	*(Hectares).*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Odanthorai ..	All survey fields in the village.	..	..	..	..	..
Kunjapanai ..	Do. ..	3,649·41	(1,470·87)	187	1,184·51	(477·73)
Manar ..	Survey field No. 6.	..	..	..	..	..

582. *Division into felling series.*—The three villages of Odanthorai, Kunjapanai and Manar will be constituted into one felling series—The Mettupalayam Village Sandal Felling Series and shall constitute only one coupe which will be worked every year.

583. *Method of treatment.*—(1) Normally sandal trees belonging to the Government occurring either on *patta* fields or in unreserves will be extracted only when they are dead.

(2) Privately owned sandal trees may however be extracted at the *pattadar's* option at suitable rates to be fixed by the department.

(3) In exceptional cases green sandal trees occurring in *patta* fields and belonging to the Government may be extracted.

584. *Analysis of sandal ownership.*—The legal position regarding sandal in *patta* lands has been already elucidated in Chapter I of Part I. Briefly the position is as follows :—

(*a*) The ownership of sandal trees in all *patta* fields assigned after 1928 vests in Government.

(*b*) The ownership of trees in *patta* fields assigned before 1928 vests with the landholder.

585. *Acquisition of private sandal.*—To prevent or minimise private trade in sandal, which affects prejudicially the Government trade and has on many occasions in the past proved to be a cloak for extensive and organised theft of Government sandal trees from the reserves and the unreserves of this division, it will be good policy for the department to purchase privately owned sandal. There is at present no legislative power to compel the land holder to sell the trees in the pre-1928 *pattas* belonging to him only to the Government. The trees have to be therefore acquired only by private negotiation. It is noteworthy that private merchants purchase trees from the *pattadars* at meagre flat rates per standing tree. Immediate payment is a powerful consideration to the land holder. With the rates of compensation that are now in force, the department can easily outbid the the private merchant. Efforts should be therefore made by the District Forest Officer to purchase all *patta* sandal at rates fixed from time to time under the orders of the Chief Conservator of Forests.

586. *Extraction of green sandal trees belonging to the Government.*—In fields assigned after the 16th of July, 1988, where all existing and possible growth of sandal belong to the Government, a state of affairs may arise when the sandal growth might become so full as to interfere with the raising of the agricultural crop. In such cases on representation by *pattadars* on his own option, the District Forest Officer may extract green sandal trees from such fields. This provision shall not however be used in such a way so to bring about large fluctuations from year to year in the yearly out-turn of sandalwood.

587. *Payment for patta sandal.*—In respect of sandal trees which are the property of the *pattadar* and which the *pattadar* has agreed to sell to the Forest Department, payment will be made on the actual weight of the rough cleaned wood, at 47½ per cent of the previous year's average sale price of finally cleaned sandalwood obtained at Government auctions at Satyamangalam and Tirupattur.

588. No payment will be made to *pattadars* for protecting the trees in the pre-1928 *pattas* which entirely belong to the Government. Similarly no payment is necessary for protecting Government trees on *sivoijama* lands.

589. *Procedure for payment.*—Whatever the quantum of compensation, it is proposed that half of it will be disbursed to the *pattadars*, immediately on the weighment of the rough cleaned wood and in any case before the wood leaves the Forest Depot. The payment will be based on the previous year's average prices. The balance will be paid after the current years' average. The price is fixed by the Chief Conservator of Forests after the December sales. Every effort will be made to complete the extraction, transport and final cleaning before December so that the wood is included for the December sales.

590. *Calculation of the possibility.*—With such unpredictable factors, forecast of yield can be little better than a guess. However, on the basis of the average yield during the past five years, a figure of ½ a ton (.508 metric tonne) is adopted.

591. *Method of executing fellings.*—The following rules will be strictly observed :—

(1) In unreserves only dead trees will be extracted.

(2) In *patta* lands, normally only dead sandal trees will be extracted, but in exceptional cases, at the request of the *pattadar* and with the prior approval of the Conservator of Forests, green sandal trees interfering with the prosecution of cultivation may be extracted. The trees so extracted will be restricted to the minimum possible.

(3) The unit of enumeration and extraction will be a survey field. In the case of sub-divisions of a field owned by different *pattadars*, the sub-division shall be the unit of working. Blocks of unreserves consisting of several survey numbers will be dealt with as one unit.

(4) The particulars of enumeration of each *patta* field or sub-division will be shown separately when necessary, but the numbering of trees in a coupe shall be done serially.

(5) Soon after the enumeration is over, the Range Officer should furnish a copy of the enumeration list to the Tahsildar so that the village officers may bring this list of trees in each field up-to-date. Early in the official year, the Tahsildar will send copies of the annual enumeration list classified girthwise and into the three types (healthy, dead and spiked) to the Range Officer and to the District Forest Officer.

592. As for the extraction and transport, etc., the revised sandal felling rules will be carefully followed.

593. The proper maintenance of survey stones is a work of prime importance. The District Forest Officer will seek the co-operation of the Collector in ensuring that stones are kept in order by the revenue establishment.

594. *Subsidiary silvicultural regulations.*—It is expected that with greater understanding of the rights, the ryots will devote more attention to the care and conservation of the sandal natural regeneration and even interest themselves in the artificial propagation of the species over field bunds at least. The Range Officer, Mettupalayam will render all possible assistance to the ryots including the supply of seed if necessary. The latest technique of sandal propagation will be taught to the ryots who come forward to do such work.

595. *Control.*—Control book in the form shown in Appendix VII shall be maintained in the District Forest Office.

SECTION B—RAISING OF LARGE-SALE IRRIGATED PLANTATIONS OF EUCALYPTUS HYBRID IN THE PATRAMANGALAM BEAT OF METTUPALAYAM RANGE.

596. There is a vast bit of flat area in the Nilgiris Eastern Slopes Reserved Forest at the foot of the steep hills which form the southern face of the Nilgiris. This vast bit of flat area almost very gently slopes into the Moyar. Most of it lies in the Patramangalam beat of Mettupalayam Range, but a comparitively narrower portion lies in the Kootha-mundy beat also. This vast area consists of at present a poor quality open scrub forest with coppice shoots of species such as *Pyrai, Sembulichan, Vellakumil, Elandai, Karai, Kambili*, etc., with a few isolated trees of Neem, Tamarind, *Poochakottai, Mandarai* (*Bauhinia racemosa*), etc. The latter were apparently retained as standards during previous working. In the current plan of Mahmood Hussain no working has been prescribed in this area in view of its inaccessible location. The entire area lies north and north-west of the Moyar and the water-spread area of the Bhavanisagar and is therefore unconnected by any road. At present the only revenue derived from this area is by sale of minor forest produce and drift and waif wood caught in the reservoir. The area enjoys a rainfall of 60 to 70 centimetres per annum. The soil is red, loamy, fairly deep but often tending to be slightly gravelly in certain localities. On account of the low rainfall in the tract there is no likelihood of the forest improving itself into a better stand merely by affording protection unless drastic measures such as systematic planting with fast grown species with provision of irrigation facilities are undertaken. The vast bit of very gently undulating terrain renders itself admirably suitable for raising irrigated plantations. On a rough estimate it is seen that an area of 5,000 acres (2,020.45 hectares) will be available for this purpose.

597. It was in this connection that a further study of the entire area was made. It was noticed that the Moyar is joined at Kallampalayam by a tributary called the Kotagiri Halla. This important tributary consists of two branches a little upstream, one called the Kotagiri Halla itself, and the other the Patticombai Halla. The latter which forms a natural boundary between Coimbatore and Nilgiris Districts is said to be a perennial river. Plenty of water is seen in this stream which flows right across the contour to join the Kotagiri Halla. If a small anicut is constructed across the Patticombai Halla at a higher level and water is diverted through a canal taken along the contour, the vast expanse of flat area in the Patramangalam beat can be irrigated in the same fashion as is now done in the Odanthorai Reserved Forest.

598. *Eucalyptus* hybrid would do very well in this area, if we can afford the minimum irrigation facilities to the planted crop. In the Odanthorai Reserved Forest which is blessed with the same locality factors, the growth of *Eucalyptus* hybrid is something rather phenomenal. Two year old saplings are on an average 20 feet (6.90 metres) in height. I do not recommend planting of teak in the Patramangalam beat, as even in Odanthorai the behaviour of teak is often mixed, at places the site quality being All-India first quality, while in certain other patches such as minor undulations where gravity irrigation water cannot reach properly or on patches of shallow gravelly soil, the behaviour of teak is poor. Experience has also shown that teak requires much more water than what was anticipated originally and it is feared whether the 15 cusecs of water provided by the Public Works Department will be ultimately sufficient. At present watering is being done even in the fourth year of the plantation. *Eucalyptus* hybrid has several distinct advantages. It is a very fast

growing species and we can work it on a short coppice rotation of 10 years. The cost of planting *Eucalyptus* hybrid is very cheap, particularly so since about last year, as it has been proved that the species can be raised by naked transplanting. It requires far less of tending than teak or other conventional species. Owing to its phenomenally fast growth, the yield obtained acre per acre is much more than any other conventional species on account of the gigantic sizes the species is capable of reaching under favourable conditions. The ultimate net profit obtained would by very much higher as no expenditure need be incurred for the second and third rotations as the species is capable of coppicing. Apart from its traditional utility as fuel, the species has industrial possibilities also as it has been proved that the closely allied *Eucalyptus globulus* is suitable for rayon pulp. It is very likely that the hybrid variety might be suitable for rayon. In this connection it is very interesting to note that the South India Viscose factory recently set up at Sirumugai with Italian colloboration is hardly within a radius of 20 miles (32.19 kilometres) from the proposed site for raising irrigated plantations and is on the southern bank of the Bhavanisagar. The South India Viscose factory has been set up primarily to utilize *Eucalyptus globulus* grown in the Nilgiris for rayon manufacture. If *Eucalyptus* hybrid is found suitable, this will cut down the cost of transport of the raw material by even 50 per cent. The Chief Conservator of Forests has already permitted the South India Viscose Company Limited to collect 5 tons (5.08 metric tonnes) of *Eucalyptus* hybrid wood from Tiruchirappalli Forest Division to be sent to Italy to test its suitability for the commercial production of rayon. The results of the pilot scale experiment may be awaited with interest.

599. In order to study the engineering possibilities of the above scheme, the writer took the Sub-Divisional Officer in-charge of investigation of Minor Irrigation Projects at Bhavanisagar for an inspection of the Patticombai Halla and the area proposed to be developed. The Sub-Divisional Officer has commended the project as highly feasible, but has suggested study of the flow of water in the *halla* for a period of 12 months before any decision on the project is taken. The Executive Engineer, Hydro-Metric Surveys, Madras who was addressed in the matter has replied that no data has been collected in the past on the discharge of water in the Patticombai Halla. The Chief Conservator of Forests has therefore suggested that proposals should be submitted for construction of a test weir across the stream before the project scheme in drawn up. The Executive Engineer, Hydro-Metric Surveys, Madras has been addressed on this. The matter may be pursued and early steps taken to construct a test weir and collect the necessary data. A detailed scheme will then be drawn up and submitted to Government for sanction.

600. The total available area suitable for irrigated planting has been estimated to be 5,000 acres (2,020.45 hectacres). Tentatively adopting a rotation of 10 years for *Eucalyptus* hybrid, an area of 500 acres (202.34 hectares) may have to be regenerated annually.

601. According to Public Works Department standards, it considered that one cusec of water is sufficient for 120 acres (48.56 hectares) of dry land cultivation or 40 acres (16.19 hectares) of wet cultivation. It is expected that water will be necessary only to establish the planted crop during the first year and so about 10 to 15 cusecs might be more than ample for our requirements. Whether irrigation may be necessary for the second and subsequent years will have to be decided by way of experience.

602. There will be no problem of protection in the plantations raised as they will be on the north-western bank of the Moyar and the Bhavanisagar Reservoirs and will be thus completely cut off from the villages of Gobichettipalayam taluk. The proposed site can be connected by a convenient road. The Mettupalayam–Kilkotagiri road which passes through the Odanthorai Reserved Forest can be extended through the Koothamundy beat up to Kallampalayam along the contour without any recourse to hair-pin bends as the terrain is very easy.

603. Mazdoor lines and subordinates quarters will have to be provided at Kallampalayam.

Section C—Utilisation of Electric Transmission Lines.

604. Two electric tower lines run through the Hulikal Teak Plantations. Both these lines extend further through the Sundapatti fuel series. Each tower line is about 100 feet

(31.2 metres) wide. These wide strips of land are not put to any use so far. The total area of these strips is quite considerable, and considering the fact that the forest area in the State is much below the desired percentage, it is all the more necessary that they are put to some use. Since growing a tree crop along these lines would interfere with the transmission lines, a shrub crop alone is recommended. These areas receive an annual precipitation of about 75 to 80 centimetres per year, but in the Hulikal Valley irrigation facilities can be made use of.

605. *Choice of species.*—In the Hulikal valley where irrigation facilities can be made use of, cultivation of pine apple appears to be eminently suitable. Outside the Hulikal valley where irrigation facilities cannot be made use of, only such species as *Avaram* and *Kolinji* (*Tephrosia* species) is suggested.

606. *Regeneration technique*—(*a*) *Cultivation of pine apple.*—The technique adopted will be as follows : At horizonal intervals of 4 feet (1.22 metres) along the contour, 1 foot (.31 metre) wide strips will be marked and the soil dug to a depth of 1 foot (.31 metre). The worked soil will be heaped in the form of a raised bund along the lines and pine apple suckers will be planted along them at an espacement of 4 feet (1.22 metres) along each line during May-June, when the first south-west monsoon showers are received. Casualties may be replaced about a month later.

607. *Irrigation.*—The intervening spaces between the bunds will be used as irrigation channels, water being obtained from the Hulikal main canal as is now being done for teak plantations. The amount of water and the irrigation regime is a matter which will have to be decided in the course of experience.

608. *Weeding.*—Two weedings combined with soil working will be done, the first one in September and the other in December.

609. *General.*—The irrigation channels will have to be maintained until the crop is harvested. The plants are expected to yield within 10 months of a year. As the portion traversed by Electric Transmission lines within the Hulikal plantations is not considerable, the entire area may be taken up for pineapple cultivation annually. The crop may be leased out separately but with the condition that the suckers are returned to the department for the next year's cultivation.

610. The Agricultural Department may be consulted for advice and suggestions whenever necessary.

611. *Cultivation of Avaram or Kolinji.*—The soil will be prepared in the same fashion as for pinenapple but the distance between the lands will be kept at 3 feet (.91 metre). It is also enough if the bunds are kept 6 inches (16 centimetres approximately) wide. Seeds of *Avaram* or *Kolinji* will be sown thick during June. The ungerminated gaps will be beaten up with fresh sowings during the north-east monsoon.

612. *Weeding.*—Two weedings combined with soil working to a depth of 6 inches (15 centimetres approximately) around the plants will be done during the first year, the first one early in September and the other in December. During the second year, no weedings will be necessary.

613. *Annual area to be tackled.*—A length of 10 chains along each transmission line will be tackled annually so that in course of time the entire area now lying fallow is put under some profitable use. Either *Avaram* or *Kolinji* will be tried in each transmission line, but mixed planting will not be adopted.

614. *Harvest of the planted crop.*—The *Avaram* crop when mature will be farmed as usual along with *Avaram* in the adjacent forest areas. *Kolinji* seeds will be collected for distribution and sale to ryots all over the State. As this species is an annual unlike *Avaram* which grows for a number of years, re-sowing of the lines grown with *Kolinji* will be necessary every year.

SECTION D—SUGGESTIONS REGARDING JURISDICTIONAL CHANGES.

615. The present Bhavani Range consists in all of 13,338.16 acres (5,397.77 hectares) including areas submergible in the Bhavanisagar reservoir. As such, the range is too small

to exist as a separate unit. In order to make the range a sizeable unit, the following changes are suggested :—

616. The entire Pethikuttai section of the Mettupalayam Range consisting of the Pethikuttai, Koothamundy and Patramangalam beats will be transferred to the Bhavani Range. This arrangement apart from lightening the Mettupalayam Range which is fairly heavy, will also bring the ntire Bhavanisagar reservoir under one range instead of the present dual control. The bulk of the Nilgiri Eastern Slopes Reserved Forest are also approacheable only through Bhavanisagar, where the headquarters of the Bhavani Range is going to be shifted. Of the three beats, the Pethikuttai beat is south of the Bhavanisagar while the other 2 beats are north of it. As such the Section Forester finds it extremely difficult to inspect all these three areas. It is therefore suggested that the Pethikuttai beat be attached to the Velamundy Section as both the forests are adjacent. The Koothamundy and Patramangalam beats can be formed into a separate section with headquarters at Kallampalayam. To this section, the Hallimoyar beat in Coonoor Range of Nilgiris Division can be also added. This arrangement will avert the present difficulty experienced by the District Forest Officer, Nilgiris, Range Officer, Coonoor and Forester, Kotagiri Section, of inspecting these areas by coming up to Bhavanisagar.

617. The existing Mettupalayam Section which consists of 6 beats is rather heavy. This section needs to be divided into two. The Manar, Sundapatti and Hulikal beats will be constituted into one section with headquarters at Nellithorai. The Odanthorai, Jaccanare and Kunjapanai beats will be constituted into another section with headquarters at Odanthorai. Sanction for an additional Forester will be therefore necessary.

SECTION E—BOUNDARIES.

618. *External boundaries.*—The clearing and maintenance of all the outer boundaries of the forests of the region shall be the work of the concerned beat subordinates as in the past. The cairns or pillars on the boundary lines should be kept in a state of good repair. Missing cairns should be reconstructed with the aid of the corresponding reserve maps and serially numbered for each reserved forest.

619. The demarcation line between the submergible areas in the Bhavanisagar project handed over to the Public Works Department and the areas under our control are not defined on the ground. It is suggested that the demarcation may be surveyed and proper stone pillars erected to indicate every turning point.

620. *Internal boundaries.*—The outer boundaries of the several enclosures inside the reserved forests as temples, shrines, hill-tribe settlements, etc., are not being maintained regularly. It is suggested that the boundaries of these enclosures may be surveyed and encroachments if any regularized. The boundaries should be also cleared annually by utilizing the hill-tribes of the particular settlement or the concerned temple authorities. A certificate to the effect that the boundaries have been cleared and checked anually should be submited by the Range Officer to the District Forest Officer.

SECTION F—FIRE PROTECTION.

621. The following fire protection measures will be carried out :—

(i) Fire tracing around all residential and non-residential buildings inside the reserved forests. These lines will be kept clean at intervals throughout the fire season.

(ii) Clearing of the existing forest roads, cart-tracks and bridle paths within the region. These roads and paths will serve as efficient fire-breaks.

(iii) The annual clearing of the external boundaries of the forests by the subordinate staff as prescribed in paragraph 618 should be insisted upon. These will to a great extent prevent the entry of fires from the surrounding *patta* lands and unreserves.

(iv) The annual clearing of the boundaries of all plantations 3 years old and below is prescribed. It is considered that this will be sufficient to prevent any chance fires.

622. No other elaborate fire protection measures are considered necessary.

623. *Fire Patrols.*—One fire patrol will be employed per beat for three or four months depending on the length of the dry season. Their job will be to assist the beat subordinates in vigilantly watching the forests from wilful incendiarism and putting out any fires if they occur.

624. *Closure of fire burnt areas.*—The majority of fires in the range are caused by graziers and collectors of minor forest produce. While the fires caused by the latter are not deliberate, graziers wilfully burn down forests for the sake of the tender grass which comes up with the first rains after a burn. Such a deliberate action can be checked only by removing the temptation to burn by closing the burnt tract immediately to grazing as a silvicultural measure, in order to enable the area to recover from the damage caused by the fire to the tree growth. The closure in all such cases should be applied before the new flush of grass shoots forth, so as to deprive the culprits of their objective.

625. *Closure of pens.*—Pens may be closed by the District Forest Officer if the area adjoining them have been severely burnt. No refund of penning fees will be allowed in such cases.

626. *Fire-fighting.*—As soon as a fire is noticed, no matter what the time, the Forest Guard and the Watcher will collect the village officials and the contractors' mazdoors from the nearest settlement and proceed to the spot and extinguish it by beating it out with branches or by counterfiring if necessary. An investigation into the cause of every fire should be made, and monetary rewards should be given to forest subordinates who detect persons setting fire to the forest. Every attempt should be made to convict such offenders, as a few such prosecutions is bound to instil a sort of fear into the villagers from indulging is such vandalistic practices.

627. *Control.*—The following control records will be maintained by the District Forest Officer.

628. (*a*) *Fire control journals.*—This journal will contain complete information on the following points :—

(i) Areas closed to grazing on account of fire.

(ii) Name and length of fire lines burnt with costs.

(iii) The incidence of fire in each reserve in the form of a tabular statement showing :—

(*a*) Total area of reserves;

(*b*) data of fires;

(*c*) area burnt;

(*d*) probable causes of fire; and

(*e*) percentage of area burnt to which special protection is accorded.

(iv) Observations of the District Forest Officer on the adequacy or inadequacy of the fire protection measures prescribed with reasons.

629. *Fire maps.*—All fires will be marked on a map drawn to a scale of 1 inch. 1 mile (1 centimetre = .06334 kilometre). Serial numbers will be given to all the fires in chronological order. One set of fire maps will be used for five successive years, fires of each year being distinguished.

SECTION G—ROADS.

630. A list of existing roads, cart-tracks and bridle paths in the Mettupalayam and Bhavani Ranges are given in Chapter V of Part I. All of them will be maintained and progressively improved. The roads and paths will be also kept free from inflammable material so as to serve as efficient fire-breaks.

631. In case the proposed scheme of raising large scale irrigated plantations of *Eucalyptus* hybrid in the Patramangalam beat is taken up, a new road will have to be formed from Odanthorai to Kallampalayam connecting it with the Mettupalayam-Kilkotagiri road.

SECTION H—BUILDINGS.

632. A list of buildings in the region is given in Chapter V of Part I. All the buildings shall be kept in a state of good repair.

633. The Government have already passed orders to shift the Bhavani Range Office from its present location at Erode to Bhavanisagar. The shift however could not be implemented readily as suitable buildings to house the office is not readily available at Bhavanisagar, although it was originally expected that the Public Works Department might be able to spare a surplus building within the project campus. It is therefore suggested that a building may be constructed by the Department near the police sub-line at Bhavanisagar in a portion of the Velamundy Reserved Forest originally handed over to the Public Works Department and is now lying unused. There is already a proposal to return this area to the Forest Department. Quarters can be also constructed at the same site for the Range Clerk and the Range peon.

634. A number of subordinates of the region require residential facilities. Suitable private quarters are often not available or are beyond the reach of the average Government servant in these days of rising costs. It is suggested that suitable buildings be constructed during the period of this plan for such of those subordinates who are not provided with Government quarters at present. The following statement gives details of forest subordinates who are in need of residential quarters :—

Mettupalayam Range.

1.	Range Officer, Mettupalayam	1
2.	Plantation Foresters for Odanthorai Reserved Forest	4
3.	Plantation Forest Guards	8
4.	Special duty Forest Guard at Mettupalayam	1
5	Forest Guard, Manar beat	1
6.	Reserve Watcher, Manar beat	1
7.	Forest Guard, Hulikal beat	1
8.	Reserve Watcher, Hulikal beat	1
9.	Forester, Mettupalayam Section	1
10.	Range Clerk, Mettupalayam	1
11.	Range Peon, Mettupalayam	1
12.	Peon to Assistant Range Officer, Mettupalayam	1
13.	Forester, Pethikuttai Section	1
14.	Forest Guard, Pethikuttai beat	1
15.	Reserve Watcher, Pethikuttai beat	1
16.	Forest Guard, Koothamundy beat	1
17.	Reserve Watcher, Koothamundy beat	1
18.	Forest Guard, Patramangalam beat	1
19.	Reserve Watcher, Patramangalam beat	1

Mettupalayam Depot.

1.	Depot Range Officer	1
2.	Depot Forester	1
3.	Depot Clerk	1
4.	Depot Watcher	1
5.	Depot Ranger's peon	1

Bhavani Range.

1.	Forester, Chennimalai Section	1
2.	Forest Guard, Chennimalai beat	1
3.	Reserve Watcher, Chennimalai beat	1
4.	Forest Guard, Arachalur beat	[illegible]

Bhavani Range—cont.

5	Reserve Watcher, Arachalur beat	1
6.	Forest Guard, Voipadi beat	1
7.	Reserve Watcher, Voipadi beat	1
8.	Forester, Velamundy Section	1
9.	Range Clerk	1
10.	Range peon	1

635. Quarters for the Range Officer, Mettupalayam, Plantation Foresters and Plantation Forest Guards for Odanthorai Plantations, Range Clerk, Range Peon, peon to Assistant Range Officer, Depot Range Officer, Depot Forester, Depot Clerk, Depot Watcher and the Depot Ranger's peon can be all constructed in the Odanthorai Reserved Forest alongside the existing quarters. This area being very close to Mettupalayam, it can be developed into a Forest Colony. In case proposals to divide Mettupalayam Section into two as suggested in paragraph 617 are implemented, quarters for the Odanthorai Section Forester can be also constructed here.

636. It may be possible to provide quarters for the Forest Guard and Reserve Watcher of Manar beat at Athikadavu within the Electricity Board campus after the third and fourth stages of the Kundah Project are completed and bulk of the Electricity staff is withdrawn.

637. Quarters for the Forest Guard and Reserve Watcher of Hulikal can be constructed within the reserved forest either near the ghat road or in a place adjacent to the Kallar fruit garden.

638. Quarters for the Forest Guard and Reserve Watcher of Pethikuttai and Koothamundi beats may be constructed in Pethikuttai and Sirumagai respectively in *poramboke* lands that may be available in these two villages.

639. If the proposals to form the new Kallampalayam Section suggested in paragraph 616 is approved, quarters for the Forester and the Forest Guard and Reserve Watcher of Patramangalam beat can be constructed in Kallampalayam adjacent to the Irular settlement. If the proposals to raise large-scale plantations of *Eucalyptus* hybrid (*vide* suggestions made in Section B) are approved, quarters for the staff that will have to be employed on this project can be also provided at Kallampalayam and the area developed into a Forest Colony.

640. Quarters for the Forester, Chennimalai Section and Forest Guard and Reserve Watcher of Chennimalai beat can be constructed within the Chennimalai Reserved Forest close to Chennimalai Town.

641. Quarters for the Forest Guard and Reserve Watcher of Arachalur and Voipadi beats can be constructed in the respective villages on *poramboke* lands which may be available.

642. Quarters for the Forester, Velamundy Section, can be constructed at 'Four Corners' within the Velamundy Reserved Forest close to the subordinate lines.

643. *Wells.*—Construction of a well at Odanthorai and Kallampalayam will be necessary along with the other buildings suggested in the preceding paragraphs for the use of the residents.

644. The existing wells in the Pethikuttai and Vellikkaradu Reserved Forests will be deepened and maintained as they would serve for watering the fuel plantations proposed to be raised in these areas under the prescriptions of the Rehabilitation Working Circle.

645. *Sanitary arrangements.*—Most of the existing subordinates' quarters do not have any latrines at all. The provision of septic tank latrines to all these buildings as also those proposed for construction is considered essential.

646. *Rest houses.*—No rest house need be constructed in place of the Niralai inspection shed which is likely to be submerged in the proposed Pillur reservoir. However a new rest house is necessary at Odanthorai, since accommodation at Mettupalayam which has only a two-roomed Public Works Department inspection bungalow is difficult to secure amidst competition from officers of other departments.

SECTION I—RAIN GAUGES.

647. The only rain gauge in the region belonging to the Forest Department is the one at Niralai in Mettupalayam Range. This rain gauge is not being maintained for the past few years at it likely to be submerged in the proposed Pillur reservoir. There is no necessity to construct another rain gauge in an alternative site close to Niralai as no regeneration works are proposed in this locality.

648. It is suggested that new rain guages may be installed at Odanthorai and Kallampalayam where large scale regeneration works are planned.

SECTION J.—BEE-KEEPING AND AMELIORATION OF HILL TRIBES.

649. Present methods of honey collection are crude and confined to only the three summer months—April, May and June when majority of the plants are in flower. Although honey collection is done departmentally, hill tribes are employed for the actual collection. These hill tribes or ' bee-hunters ' spot out the natural colonies in the forest and wait till the right time for the extraction of honey from the combs. Then they scare away the bees by administering fine or smoke; and squeeze out the contents of the combs. The resulting liquid (which is the mixture of ripe and unripe honey, pulses, eggs, larvae, pupae, the visceral contents of young bees, charred matter and wax) is called as honey.

650. Honey of this type does not possess any keeping qualities. On the contrary, it is injurious to health. In the process of collection, the combs and a large number of bees are destroyed. The construction of combs is a long process taking the bees much labour, food and time. Scientific rearing of bees with established apiaries is the only remedy to prevent this crude method of collection. In this method, extraction of honey is done by the honey extractor without resorting to destruction of the comb and much of the labour of the bees can be saved. The honey obtained also will be pure and acceptable to the market. The forest is a great source of plants bearing nectar yielding flowers and bee-keeping in a scientific form has great prospects particularly in the Mettupalayam Range which is fairly well wooded and has a number of hill tribe settlements. It is suggested that apiaries with 30 to 50 bee hives can be installed in each hill tribe settlement and one person from each settlement appointed as the Watcher for each apiary. A suitable forester trained in bee-keeping at the bee-keeping station at Mahabaleshwar or the Coimbatore Agricultural College apiary for a period of 3 to 6 months can be appointed to supervise all the apiaries within the Mettupalayam Range. This arrangement apart from proving profitable to the Department will also help in finding employment to the hill tribes, not to speak of the increase in stock of this valuable minor forest produce.

651. Efforts should be also taken by the Range Officer, Mettupalayam, in utilizing the hill tribes within the range in *kumri* cultivation in regenerating the felled fuel coupes, thereby providing them employment and more land for cultivation.

652. The territorial staff should also take full advantage of the funds provided under the Tribal Development Schemes to provide the hill tribes with water, houses, education and medical aid by keeping close contact with the State Harijan Welfare Department which is in charge of executing the schemes.

SECTION K—PLANTING OF SHADE TREES IN THE METTUPALAYAM TIMBER DEPOT.

653. The new timber depot which was opened in the Odanthorai ex-panchayat Reserved Forest during 1960 is devoid of any shade trees worth the name. It is suggested that the entire area be planted up with seedlings of *Thoongumonji maram* (*Samanea saman*) at an espacement of 60 feet × 60 feet (18.29 metres × 18. 29 metres). This species which develops a gigantic crown is an ideal shade tree. The shade trees when grown up will not only prevent the timber from splitting due to the effects of the hot sun, but also promote better work by the depot staff.

SECTION L—PRESERVATION OF WILD LIFE.

654. The need for preservation of wildlife in the region is paramount as it is elsewhere in the State on account of their general scarcity.

655. Although illicit shooting within the region is at the minimum, the usual measures should be taken to enforce the game laws rigidly. Forest subordinates detecting poaching cases should be amply rewarded as this will serve as an incentive for similar work in the future. Greater discretion should be also exercised in the issue of shooting licences. It is suggested that a black list of all bad sportsmen is maintained at the District Forest Office, and this record consulted before issue of any game licences.

656. Other efforts to promote the cause of wildlife are also necessary. The Bhavanisagar lake and its environs which harbour a large variety of birds must be further improved to serve as a source of attraction to birds by planting fruit trees along the edge of the reservoir. The common banyan trees (*Ficus benghalensis*), the *Arasamaram* (*Ficus religiosa*) and *Kaddapay* (*Barringtonia acutangula*) are quite suitable for this purpose. The large number of ripe berries borne by these trees are a great source of attraction to many birds. While the banyan and *Arasamaram* can be easily propagated by planting cuttings of branches, *Kaddapay* can be raised by direct sowings. Apart from increasing the number of birds, these trees will also serve to increase the aesthetic value of the lake and its surroundings.

657. The District Forest Officer should take personal interest in the implementation of the suggestions made in this section and in such other useful measures as he considers necessary.

SECTION M—CONTROL.

658. The control records and maps which are to be maintained in the District Forest Office have been dealt with under the various working circles. The posting and maintenance of control records and maps is a matter of vital importance and must receive the personal attention of the District Forest Officer. Special emphasis is laid on this because the maintenance of control records in the past have not been satisfactory.

659. *Control book.*—This register will show all operations actually carried out in connection with the exploitation in each felling series as per prescriptions of the working plan, as well as such measures as are neither prescribed nor suggested but are carried out.

660. *Record of works.*—All works carried out under the prescriptions of the working plan as well as such measures as are neither prescribed nor suggested but are carried out, will be recorded in this form.

661. *Register of deviations.*—This is a register of deviations showing every case of deviation from the prescription of the working plan, the need for the deviations, and the authority by whom it was sanctioned.

662. It is suggested that the Control Book, Record of Works and the Register of Deviations be maintained separately for each working circle. A list of the control forms to be maintained for each working circle is given in Appendix VII.

663. *Control maps.*—The control maps will show on a 4 inches=1 mile (1 centimetre = .1584 kilometres) scale the areas proposed for working every year, the areas actually worked, areas annually regenerated with the name of the species planted or sown and with the dates of original planting.

664. *Control journals.*—The control journal will give a detailed account of the management of the range. The object of this journal is to secure a running commentary on all objects of administration, specially on the extent to which the objects of the working plan have been realized and the extent to which the methods prescribed have been found suitable in the Control Book and the Record of Works. The journal is intended to give the District Forest Officer an opportunity for recording suggestions for modification and improvements in the methods of working laid down in the working plan. If it is maintained it should be of great help when the plan comes to be revised. The journal should therefore be taken into camp by the District Forest Officer and critical observations should be recorded in it during or after inspection

665. It is suggested that the control journal be maintained separately for each working circle. A summary of annual revenue and expenditure in a form to facilitate comparison with the financial forecast in this plan will also be recorded every year.

666. The control journal is a technical record and must be maintained personally by the District Forest Officer. A copy of the entries made during the year should be submitted to the Conservator of Forests, Coimbatore Circle, soon after the close of each financial year along with a copy of the deviation statement, the control forms and maps.

SECTION N—PLANTATIONS AND NURSERY JOURNALS.

667. In addition to the control forms prescribed under the previous section, plantation and nursery journals should be maintained wherever artificial regeneration operations are involved.

668. *Plantation journal.*—A plantation journal will be maintained for each plantation showing its location, area, a sketch of the plantation on a scale of 16 inches to a mile (1 centimetre—0.03963 kilometre), the nature of the previous growth, the revenue obtained if any by clearing the growth, the details and cost of formation of the plantation, and further history like thinnings, defoliator control, etc.

669. *Nursery Ledger.*—A nursery journal will be maintained for each year's nursery showing its location and number, size of beds, species sown, seed-origin, date of sowing, nursery technique adopted, watering regime, cost of maintenance, etc.

670. Both the plantation and nursery journals will be maintained personally by the Range Officer. Inspecting officers will note their remarks on these journals which will be replied to by the Range Officer. Copies of these journals will be maintained at the District Forest Office also.

CHAPTER X—ESTABLISHMENT AND LABOUR.

SECTION 1—ESTABLISHMENT.

671. No additional staff is necessary for the works prescribed under the Irrigated Teak Plantation Working Circle as the present scale of staff is quite sufficient.

672. The artificial regeneration of fuel coupes and the ex-panchayat forests will involve some amount of additional work on the protective staff. Since there would not be ordinarily one regeneration area is each beat, this work can be attended to by the beat guard and his watcher with the help of the plot mazdoor. It is therefore not necessary to appoint additional staff purely for regeneration purposes as the beat subordinates presently do not have any other work besides protection during the major portion of the year.

673. If the scheme for planting *Eucalyptus* hybrid in the Patramangalam beat is approved, separate proposals for additional staff for this project will have to be made. The actual staff that may be necessary will have to be decided after the details of the project such as the annual area to be tackled, construction of roads, buildings and other formalities are decided upon.

674. If the suggestion made in paragraph 617 to divide the Mettupalayam section into two is implemented, sanction for an additional Forester will be necessary. Similarly if the proposal to instal apiaries in each Irular settlement is to be implemented, one Forester and as many apiary watchers as there are settlements will be necessary.

SECTION 2—LABOUR.

675. Mention has been made in Chapter IV of Part I about the difficulty in procuring sufficient labour for the works connected with the irrigated teak plantations in the Odanthorai Reserved Forest. In addition to the amenities already provided for in Odanthorai Reserved Forest it is suggested that other facilities such as a well, a primary school, medical aid and a co-operative stores be provided as better incentives to attract more labour. The existing wages may also have to be revised so as to conform to the wages paid by private industries in the locality.

676. For other routine departmental works, no difficulties are felt in recruiting labour at present. Hence, no special prescriptions are made.

CHAPTER XI—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

SECTION 1—FINANCIAL FORECAST.

677. The following statements show :—

1. The estimated revenue and expenditure in respect of each working circle for the period of this plan; and

2. An abstract of the forecast—

Year. (1)	*Revenue in rupees.* (2)	*Expenditure in rupees.* (3)
	1. *The Reserve Sandal Working Circle.*	
1963–64	1,60,440·00	940·00
1964–65	1,60,440·00	780·00
1965–66	1,60,440·00	1,000·00
1966–67	1,60,440·00	770·00
1967–68	1,60,440·00	800·00
1968–69	1,60,440·00	1,480·00
1969–70	1,60,440·00	830·00
1970–71	1,60,440·00	940·00
1971–72	1,60,440·00	780·00
1972–73	1,60,440·00	800·00
	2. *The Fuel Working Circle.*	
1963–64	22,820·00	990·00
1964–65	27,490·00	5,550·00
1965–66	25,840·00	6,530·00
1966–67	27,070·00	6,210·00
1967–68	27,340·00	6,400·00
1968–69	27,020·00	6,550·00
1969–70	27,060·00	7,450·00
1970–71	29,910·00	6,310·00
1971–72	27,770·00	6,280·00
1972–73	26,340·00	6,480·00

As the areas felled during 1963–64 can be planted only during 1964–65, no expenditure will be incurred on regeneration (except nursery work) during the year 1963–64.

3. *The Rehabilitation Working Circle.*—No revenue is expected from this working circle. The expenditure annually anticipated is indicated in the following statement:—

Year.	*Revenue in rupees.*
1963–64	17,050·00
1964–65	19,050·00
1965–66	19,050·00
1966–67	19,050·00
1967–68	19,050·00
1968–69	19,050·00
1969–70	19,050·00
1970–71	19,050·00
1971–72	19,050·00
1972–73	19,050·00

4. *The Irrigated Teak Plantation Working Circle.*—

Year. (1)	*Revenue in rupees.* (2)	*Expenditure in rupees.* (3)
1963–64	11,500·00	20,700·00
1964–65	11,700·00	20,700·00
1965–66	11,700·00	20,700·00
1966–67	11,700·00	20,700·00
1967–68	11,700·00	20,700·00
1968–69	11,700·00	20,700·00
1969–70	11,700·00	20,700·00
1970–71	11,700·00	20,700·00
1971–72	11.700·00	20,700·00
1972–73	11,700·00	20,700.00

The increase in expenditure over revenue will continue untill all the areas proposed for conversion in the Odanthorai Reserved forest are planted up.

5. *The Bamboo Working Circle.*—There will be no expenditure in this working circle. The annual revenue will vary from year to year due to difference in the size of the coupes.

Year.	*Revenue in rupees.*
1963-64	34,000·00
1964-65	8,450·00
1965-66	8,660·00
1966-67	19,760·00
1967-68	8,450·00
1968-69	8,660,00
1969-70	19,760·00
1970-71	8,450·00
1971-72	8,660·00
1972-73	19,760·00

6. *The Minor Forest Produce Working Circle.*

Year. (1)	Revenue in rupees. (2)	Expenditure in rupees. (3)
1963-64	8,730 00	620 00
1964-65	8,660 00	620 00
1965-66	8,630 00	620 00
1966-67	8,730 00	620 00
1967-68	8,630 00	620 00
1968-69	8,650 00	620 00
1969-70	8,750 00	620 00
1970-71	8,630 00	620 00
1971-72	8,650 00	620 00
1972-73	8,730 00	620 00

The increase in revenue anticipated during 1963–64, 1966–67, 1969–70 and 1972–73 will be due to sale of *Konnai* bark during these years.

7. *The Grazing Working Circle.*—An annual expenditure of Rs. 5,000 is anticipated. There will be no expenditure.

678. *Miscellaneous.*—An annual revenue of Rs. 6,000 and an annual expenditure of Rs. 28,500 are anticipated. The expenditure will include extraction costs of *patta* sandal; maintenance of buildings and roads, formation of new buildings proposed in this plan, installation of new rain gauges, planting of transmission lines, preservation of wild life, installation and maintenance of apairies, fire protection, rates and taxes, postages, maintenance and renewal of stores, and other miscellaneous expenses. No provision has been however made for the large scale planting of *Eucalyptus* hybrid as this is a capital scheme which can be taken up only with the specific sanction of the Government, after due investigation.

679. *Establishment.*—The expenditure towards the establishment will be annually Rs. 88,500. This will include three-fifths of the share charges of the District Forest Officer and his office at Coimbatore.

680. *Abstract of the Forecast.*—The total revenue and expenditure for the entire region for each year for the ten year period of this plan is estimated as follows :—

Year. (1)	*Revenue in rupees.* (2)	*Expenditure in rupees.* (3)	*Surplus in rupees.* (4)
1963-64	2,60,540·00	1,57,300·00	1,03,240·00
1964-65	2,41,790·00	1,63,700·00	78,090·00
1965-66	2,41,220·00	1,64,900·00	76,320·00
1966-67	2,52,750·00	1,64,350·00	88,400·00
1967-68	2,41,610·00	1,64,570·00	77,040·00
1968-69	2,41,520·00	1,65.400·00	76,120·00
1969-70	2,52,760·00	1,65,650·00	87,110·00
1970-71	2,44,180·00	1,64,620.00	79,560·00
1971-72	2,42,270·00	1,64,430·00	77,840·00
1972-73	2,52,020 00	1,64,650·00	87,370·00

681. The foregoing abstract of estimated revenue and expenditure does not include the share or charges on account of the Conservator of Forests, Coimbatore Circle and his establishment.

SECTION 2—COST OF THE WORKING PLAN.

682. The cost of preparation of this working plan is given below :—

Particulars.	*Expenditure incurred.*
Pay of Officers	3,150·00
Pay of Establishment	3,762·49
Dearness Allowances	479·82
Other Compensatory Allowances	315·88
Travelling Allowances	1,074·74
Fixed Travelling Allowances	209·50
Contingencies (including pay of Office Watcher)	2,024·37
Working Plan Works	38·89
Total ..	11,055·69

683. One Working Plan Officer in the category of an Assistant Conservator of Forests in the Madras Forest Service, one Ranger, two Foresters, one clerk and three peons formed the establishment of the working plan division.

684. The works connected with the preparation of this working plan were taken up on 1st January 1962 and completed on 5th July 1962.

SUMMARY OF PRESCRIPTIONS.

Chapter I—Basis of Proposals.

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Objects of Management.—The objects of management are briefly— 281

(i) To conserve the forests of the region in the interest of soil conservation, water-supply and agriculture;

(ii) To protect the forests against damage by man, fire and other harmful factors;

(iii) To exploit subject to silvicultural principles the resources of the forests in sandalwood, small timber, fuel, bamboos and minor forests product;

(iv) to rehabilitate the degraded ex-panchayat forests with suitable indigenous and exotic fuel species;

(v) to tend the sandal growing stock;

(vi) to provide the grazing requirements of the local population;

(vii) to provide the domestic requirements of hill tribes settled within the reserved forests;

(viii) to provide better amenities for the accommodation of the subordinate staff of the region; and

(ix) generally to take all steps to attain the maximum financial return per acre of forest in perpetuity.

Working Circles.—The following working circles have been constituted— 283

	Area in acres.	Area in hectares.
1 The Reserve Sandal Working Circle	21,899	(8,862·30)
2 The Fuel Working Circle	2,892	(1,170·36)
3 The Rehabilitation Working Circle	11,720	(4,762·96)
4 The Irrigated Teak Plantation Working Circle	4,881·25	(1,969·28)
5 The Bamboo Working Circle	16,425	(6,646·33)
6 The Minor Forest Produce Working Circle	All the reserves.	
7 The Grazing Working Circle	Do.	

PARAGRAPHS.

Period of the working plan.—This working plan will be in force for a period of ten years from 1st April 1963 to 31st March 1973. Indications regarding the areas to be worked in the succeeding five years have also been made as a guide for work to be carried on in case there happens to be any delay in taking up the revision before this plan lapses. 284

Chapter II—The Reserve Sandal Working Circle.

General constitution.—This working circle will include all the sandal areas in the Mettupalayam Range. 285

Area.—The total area of this working circle is 21,899 acres (8,862.30 hectares) of which the effective sandal area is 11,399 acres (4,613.06 hectares). 286

Division of the area.—The working circle is divided into two felling series. Details of areas included in each felling series are given. 288

Silvicultural system.—The silvicultural system followed will be the "Natural Selection System" according to which only dead trees will be extracted. 291

Felling cycle.—The current felling cycle of six years will continue. If the felling series is heavily spiked the Conservator will have the discretion to reduce the felling cycle to three years. 292

Regulation of the yield and division into coupes.—The yield will be regulated by area, each felling series being divided into six coupes. 293

Method of executing fellings.—The exploitation of sandal is done departmentally under the prescriptions laid down in the Sandalwood Felling Rules. The rough-cleaned wood will be transported to the sandal wood depot in Satyamangalam for sale. 294 to 297

Tabular statement of fellings.—Details regarding the coupes and their year of working are furnished. 298 and 299

Subsidiary silvicultural operations.—Tending of the sandal crop will be done along with the enumeration of sandal on a six years felling cycle. The tending rules is not prescribed owing to prevalence of spike in the region. 300 to 302

Other regulations.—Retail sale of sandal billets will be continued at the District and Range Offices. The entire working circle will be open to grazing. No special methods of fire protection are prescribed. 303 to 305

Control.—The control records to be maintained for this working circle are indicated. 306 to 308

Chapter III—The Fuel Working Circle.

Objects of management.—The main object of this working circle is to ensure the sustained production of fuel. 309

General constitution.—This working circle will include all areas allocated to the Fuel Working Circle in Hussain's working plan excepting the Modur and Chennimalai series which have been excluded for paucity of growth. 310

Area.—The area of the working circle is 2,892 acres (1,170.36 hectares). 312

Division of the area.—The working circle is divided into 2 felling series both of which fall in the Mettupalayam Range. Details of areas included in the felling series are given. 315 to 417

Silvicultural system.—The silvicultural system adopted will be the 'coppice with reserves' system supplemented by artificial regeneration. 320

Choice of species.—Neem, Tamarind, *Karuvelam*, *Kodaivelam*, *Velvagai* and *Eucalyptus* hybrid are the species prescribed for planting. 322

Rotation.—The rotation is fixed at 30 years. 324

Regulation of the yield.—The yield will be regulated by area. 325

PARAGRAPHS.

Numbering of coupes.—In numbering the coupes, Coupe VIII of Hussain's plan which is to be worked during 1963–64 has been marked as Coupe I, and Coupe VII which was worked during 1962–63 as Coupe XXX. 326

Method of executing fellings.—The annual coupe will be laid out in accordance with the felling series map by cut lines 6 feet (1.83 metres) wide. Trees on the outer periphery of the forest adjoining the coupe will be ring marked and serially numbered to serve as a mark of demarcation. Each coupe will be divided into strips. The coupes will be sold annually and the exploitation of the areas will be through the agency of contractors. The *voidah* for working will depend on the area of the coupe and shall commence from the first of April. Coupe areas, if any, at the end of the *voidah* will be sold separately. All growth in the coupe will be felled except the following species which will be marked as reserved, viz., Sandal, Tamarind, *Kadukkai*, *Pinnai*, Neem, *Iluppai* and *Ilavam*. The felling rules are discussed. 327 to 337

The contractor will be bound to supply fuel in head loads and small timber for agricultural purposes from the coupe to all ryots and jaggery co-operative societies at rates to be fixed by the District Forest Officer in consultation with the Collector. 338

Tabular statement of fellings.—A detailed statement of the coupes to be felled during the ten years of the plan is given. Indications regarding areas to be felled during the succeeding five years are also given in case the revision of the working plan is not taken up in time. 340 and 341

Regulation of regeneration operations.—The necessity for artificial regeneration work in the felled coupes is discussed. All regeneration work will be done in conjunction with *kumri*. 342 to 348

All growth left by the contractor will be felled and burnt. Planting lines 11 feet (3·35 metres) apart will be aligned along the contour and worked to a dimension of 1′ × 1′ (·31 metre × .31 metre) along each planting line at intervals of 11 feet (3·35 metres) where stakes will be put. Since in most of the areas *kumri* regeneration has to be initiated for the first time, as a sort of compromise the espacement will be kept at 16 feet × 8 feet (4.88 metres × 2·44 metres) during the first year but reduced to 11 feet × 11 feet, (3.35 metres × 3.35 metres) during the subsequent years. Irrespective of the above espacement, pits 1 foot (0.31 metres) cube will be dug all over the area at an overall espacement of 30 feet × 30 feet (9·14 metres × 9.14 metres) to be planted with tamarind. 349 to 351

Seeds of Neem, Tamarind, *Karuvelam*, *Kodaivelam* and *Velvagai* will be sown along the lines on receipt of the first showers of the south-west monsoon. At the same time, pot plants of Neem and Tamarind and naked plants of *Eucalyptus* hybrid will be planted at each stake at 11 feet (3·35 metres) intervals along the planting lines. At the same time, 2 year old pot plants of tamarind will be planted all over the regeneration are at an overlapping espacement of 30 feet × 30 feet (9·14 metres × 9.14 metres). 352 to 355

Nursery.—Details regarding seed collection, storage and nursery technique for the various species chosen for planting are given. 356 and 357

Subsidiary silvicultural operations.—The casualties will be replaced during the north-east monsoon. Three weedings combined with soil working will be done during the first two years. 368 to 376

Other regulations.—The four salient corners of each coupe will be demarcated by cut stone slabs showing the year of working, coupe number as well as the adjacent coupe number and its year of working. 377

Plantation boards will be hung at salient corners of the plantation showing particulars of the area regenerated. 378

The regeneration areas will be fenced by raising a live fence of *Seemai Vanni*. A thorn fence will be raised for the first two years until the live fence will be able to take the place of the thorn fence. 379

The felled coupes will be closed to grazing for a period of five years excluding the year of exploitation. 380

Closure to grazing of areas subject to large scale fires is prescribed 382

	PARAGRAPHS.
A plot mazdoor will be appointed for each year's regeneration area.	384
Control.—The control records to be maintained for the working circle are indicated.	386 to 389

Chapter IV—The Rehabilitation Working Circle.

Objects of management.—The main object of this working circle is to rehabilitate the degraded ex-panchayat forests of the region with suitable fuel species.	390
General constitution.—The working circle will consist of all the ex-panchayat forests in the region.	391
Area.—The area of the working circle is 11,720 acres (4,762.96 hectares).	392
Division of the area.—The working circle is divided into 5 planting series. Details of areas included in each planting series are given.	394 and 395
Silvicultural system.—The system adopted will be to artificially restock the degraded ex-panchayat forests with suitable fuel species.	399
Choice of species.—Neem, Tamarind and *Eucalyptus* hybrid will be the species chosen for planting.	400
Rotation.—Tentatively a rotation of 30 years will be adopted.	401
Annual planting area.—An area of 50 acres will be planted annually in each series.	402
Regulation of regeneration operations.—The annual regeneration areas will be surveyed and demarcated by cut lines 6 feet (1.83 metres) wide. All standing growth in the area will be cut and saleable growth if any will be sold in auction. The trench and mound technique will be adopted as the method of regeneration . Short trenches 3′ × 1′ × 1′ (.91 metre × .31 metre × .31 metre) will be dug along the contour at a distance of 11 feet (3.35 metres) from centre to centre. The distance between the succeeding lines will be kept at 11 feet (3.35 metres). Pot plants of Neem, Tamarind and *Eucalyptus* hybrid will be planted in the centre of each mound with the onset of the north-east monsoon.	404 to 410
Kumri is not prescribed as the soil and rainfall conditions are not conductive for such work.	411
Nursery.—Details regarding seed collection, storage and nursery technique for the various species chosen for planting are indicated.	412
Subsidiary silvicultural operations.—Watering each plant with five litres of water once a fortnight during the dry months of the year is provided so as to establish the planted crop.	413
Casualties will be replaced a fortnight after planting as also the second year.	414 and 415
Three weedings combined with soil working will be done during the first two years.	416
Other regulations.—Plantation boards will be hung at the salient corners of the plantation showing particulars of the area regenerated.	417
The regeneration areas will be fenced by raising a live fence of *Seemai Vanni.* A thorn fence will be raised for the first two years until the live fence will be able to take the place of the thorn fence.	418
The regeneration areas will be closed to grazing for a period of five years.	419
The plantation boundaries will be cleared annually as a measure of fire protection.	421
A plot mazdoor will be appointed for each year's regeneration area.	422
Control.—The control records to be maintained for the working circle are indicated.	425

PARAGRAPHS.

Chapter V—The Irrigated Teak Plantation Working Circle.

General constitution.—This working circle will include the teak plantations raised in the past by the method of irrigation as also areas proposed to be converted in the future	426
Areas.—The area of this working circle is 4,881.25 acres ,1,969.28 hectares) are now covered with existing teak plantations.	427
Division of the area.—The working circle is divided into two series, viz., Hulikal series and Odanthorai series. Details of areas included under each felling series are given.	429
Silvicultural system.—The silvicultural system adopted for the Hulikal series will be the 'simple coppice system' supplemented by artificial regeneration wherever necessary. In the Odanthorai series, the natural forests will be clearfelled and artificially regenerated with teak. In both the series, regeneration will be done under the method of irrigation.	432
Choice of species.—Teak will be the main species adopted. On elevated patches *Eucalyptus* hybrid will be raised. Similarly in low lying portions *Eucalyptus rostrata* or *Karumarudu* will be planted.	433
Rotation.—The rotation is fixed as 20 years.	434
Regulation of the yield.—In the Hulikal series the yield will be regulated by area. In the Odanthorai series the regulation of yield will not arise at present as no fellings are proposed during the period of this plan.	435
Annual regeneration areas.—An area of 100 acres will be annually regenerated in the Odanthorai series.	437
Method of executing fellings.—The annual coupe will be laid down by cleared lines six feet (1.83 metres) wide.	439
In the Hulikal series exploitation will be done departmentally. The converted produce will be sold in auction after transport to forest depot. The classification to be adopted is indicated. Poles suitable as electric transmission poles will be converted separately and handed over to the Electricity Board.	440 to 443
In the Odanthorai series the clearfelling coupe will be sold in auction. A *voidah* of nine months will be granted. The contractor will be required to reserve sufficient material in the ground nto ensure a burn for which purpose twigs and branches below six inches (15 cms.) will not be removed. For this purpose, head-load removals will be prohibited. Coupe arrears if any, at the end of the *voidah* will be worked departmentally.	444 to 446
Tabular statement of fellings.—The plantations to be felled during the period of the plan in the Hulikal series are indicated.	447
Regulation of regeneration operations.—In the Hulikal series no burning will be done. In the Odanthorai series the regrowth in the coupe will be cut, heaped, burnt and reburnt.	449 and 450
Subsidiary and feeder canals will be formed in each plantation. Espacement will be 8½ feet × 8½ feet (2.59 × 2·59 metres) generally, but on patches of poorer soil an espacement of 6 feet × 6 feet (1·83 metres × 1.83 metres) will be adopted. Planting will be done during the south-west monsoon utilizing nursery raised stumps of teak. Elevated patches unsuited for teak will be planted with naked plants of *Eucalyptus* hybrid. Similarly swampy localities will be planted with naked plants of *Eucalyptus rostrata* or stumps of *Karumarudu*. Casualties will be replaced and completed by July.	441 to 450
Nursery.—The nursery techniques for teak and the other species chosen for planting are indicated.	457 to 474
Subsidiary silvicultural operations.—The watering regime during the first four years is detailed.	475
Underplanting of the teak with *Daincha* or camphor tulsi is prescribed.	478

PARAGRAPHS.

Casualties will be replaced during the first two years. Patches in which teak fails repeatedly will be planted with *Eucalyptus* hybrid during the second year. 479 and 480

The details of weeding and soil working to be done in the first four years are indicated. 481 to 486

Two thinnings will be done at the age of 7 and 13 years. The intensity prescribed is D grade. A climber cutting will be done at the time of marking. The thinning programme for the ten-year period of this plan is indicated. The thinned produce will be converted and disposed of in the same manner as for final fellings in the Hulikal series. 487 to 493

Other regulations.—Plantation boards will be hung at salient corners of each plantation showing particulars of the area regenerated. Properly aligned inspection paths will be laid out in each plantation. 494 and 495

All the plantations raised under this working circle will be indefinitely closed to grazing. 497

Kumari cultivation.—Will be prohibited for which reasons are given. 499

Control.—The control records to be maintained for this working circle are indicated. 501

Chapter VI—The Bamboo Working Circle.

General constitution.—This working circle will include all areas included by Mahmood Hussain in his Bamboo Working Circle for the Mettupalayam Range without any change. 502

Area.—The area of this working circle in 16,425 acres (6,646.33 hectares). The effective area bearing bamboo is estimated to be 15,295 acres (6,189.38 hectares). 503

Division of area.—The working circle will consist of four felling series, the details of which are furnished. 505 and 506

System of management.—The system of management adopted may be defined as 'Selection thinning of bamboo clumps'. 509

Felling cycle.—A felling cycle of three years will be adopted. 510

Regulation of the yield.—The yield will be regulated by area. 511

Method of executing fellings.—The coupes will be exploited through the agency of contractors. The coupe will be annually exploited. A set of rules to regulate the felling is prescribed. The contractor will be bound to supply bamboos to ryots for domestic and agricultural purposes and Basket Makers' Co-operative Societies at rates to be fixed by the District Forest Officer in consultation with the Collector. 512 to 516

Tabular statement of fellings.—Details regarding the coupes and their year of working are furnished. 517 and 518

Other regulations.—All the forests included in this working circle will be opened to grazing. 519

Control.—The control records to be maintained for this working circle are indicated. 521 to 525

Chapter VII—The Minor Forest Produce Working Circle.

General constitution.—This working circle will include all the forests under the control of the Forest Department in the region. 526

Analysis and valuation of the crop.—The chief items of minor forest produce occurring in the area are mentioned. 527

Division of the area.—The details of the units of sale formed are given. Wherever any produce is abundant, such as gallnuts, *avaram* and *konnai* bark they are put up for sale separately. 528

PARAGRAPHS.

Method of treatment.—All minor forest produce other than stone and gravel, honey and bees-wax, ivory, deer and sambhur horns and valuable remains of dead animals will be exploited through the agency of contractors. The annual lease will commence from the first of July to the 30th June for all units except *avaram* bark, *sundukkai* and tamarind. For *avaram* bark, the lease period will be from 1st April to 31st March. In the case of tamarind, the lease period will be for six months from the 1st of January to the 30th of June. For *sundakkai*, the lease period will be also six months, but the period will be from 1st of October to the 31st March. *Konnai* bark will be sold once in three years. Stone and gravel will be sold on seigniorage permits from approved quarries. 529 to 540

Subsidiary silvicultural operations.—Planting of pot plants of tamarind on either side of cart-tracks and roads passing through the reserved forests at a rate of 20 plants annually per beat is prescribed. 541 to 543

Sowing of *shekoy* seeds in lines 11 feet (3.34 metres) apart in five acres (2.02 hectares) of area in any one of the fuel coupes to be regenerated annually is also prescribed. 544 to 547

Planting of palmyra along the boundaries in the Reserved Forests in Erode taluk is also prescribed. The espacement will be 6 feet (1.83 metres). 548 to 551

Control.—The control records to be maintained for this working circle are indicated. 552 to 553

Chapter VIII—The Grazing Working Circle.

General constitution.—This working circle covers the entire region except areas specifically closed to grazing. 554

Method of treatment.—Grazing will be regulated by the issue of permits. 563 to 564

The whole of the Coimbatore Central Forest Division will form one grazing unit. 567

Grazing fees will be collected departmentally. 568

Fodder grass removal in head-loads by ryots and co-operative milk supply unions will be permitted from the reserved forests in accordance with the policy of the Government. 569

Penning cattle within the reserved forests will be allowed. A list of existing cattle pens is given. 570 to 573

Other regulations.—A grazing notification will be published annually specifying the areas closed to grazing and the conditions regulating grazing. 575

Areas closed to grazing will be marked on the ground by red sign boards. 576

The control records to be maintained for this working circle are indicated. 577 and 578

Chapter IX—Miscellaneous Regulations.

A. *Village Sandal Working.*—The existence of sandal in the unreserves and patta fields in three villages of Mettupalayam Range is mentioned. Details of the villages containing *patta* sandal are furnished. 580 and 581

The three villages will be constituted into one felling series which shall constitute one coupe. 582

Normally sandal trees belonging to Government alone will be extracted. Privately owned sandal trees will be however extracted at the pattadar's option. 583

The legal position of *patta* sandal is explained. 584

In cases where *patta* sandal is extracted by Government the procedure to be adopted for payment of compensation is detailed. 585 to 589

The extraction will be done in accordance with the sandalwood felling rules. 591 and 592

PARAGRAPHS.

Assistance will be given by the Department to the ryots for artificial propagation of sandal along their fields. 594

The control records to be maintained for this section are indicated. 595

B. *Raising of large scale irrigated plantations of Eucalyptus hybrid in the Patramangalam beat of Mettupalayam Range*—Mention is made of the existence of 5,000 acres of flat area in the Patramangalam beat of Mettupalayam Range at present consisting of a scrub forest not put to any use. The possibility or raising large scale irrigated plantations of *Eucalyptus* hybrid by the method of irrigation utilising the water of the Patticombaihalla is mentioned. The investigations to be pursud before preparing a project report for obtaining Government sanction are indicated. 596 to 603

C. *Utilisation of electric transmission lines.*—The existence of two electric transmission lines in the Hulikal Valley of Mettupalayam Range is mentioned. The transmission lines will be planted with pineapple in the Hulikal Valley where irrigation facilities are available and with *Avaram* and *Kolinji* in the Sundapatti Valley where dry cultivation will have to be resorted to. 604 and 605

Pineapple suckers will be planted at 4 feet apart (1.22 metres) along lines taken at 4 feet (1.22 metres) intervals along the contour and worked to a depth of 1 foot (.31 metres). Two weedings combined with soil working will be done and the lines irrigated with water from the Hulikal Channel. The crop will be leased out annually. 606 to 610

Avaram or *Kolinji* seeds will be sown on lines similarly prepared as for pineapple cultivation, but the interval between lines will be kept at 3 feet (.91 metre). A length of 10 chains will be tackled annually in each electric transmission line. The *Avaram* crop will be leased out along with the *Avaram* in the adjacent forest areas. *Kolinji* seeds will be collected departmentally for distribution to ryots. 611 to 614

D. *Suggestions regarding jurisdictional changes.*—The entire Pethikuttai section of Mettupalayam Range will be transferred to the Bhavani Range. The Pethikuttai beat will be attached to the Velamundy section. The Koothamundy and Patramangalam beats will be constituted into a separate section with headquarters at Kallampalayam. To this section the Hallimoyar beat of Coonoor Range in the Nilgiris will be also added. 616

The Mettupalayam Section will be divided into two sections as it is now heavy. 617

E. *Boundaries.*—The maintenance of all external boundaries of the reserved forests by the beat subordinates is prescribed. 618

The areas under the control of the Public Works Department in the Bhavanisagar Reservoir will be properly demarcated on the ground. 619

The survey and annual clearance of all settlement boundaries and regularisation of encroachments wherever found are prescribed. 620

F *Fire protection*—The fire protection measures to be adopted are indicated. 621

Fire patrols at the rate of one per beat will be maintained during the fire season. 623

The closure of fire burnt areas and pens to grazing is prescribed. 624 and 625

The measures to be taken in the case of an accidental fire are indicated. 626

The control records to be maintained for this section are indicated. 627 and 629

G. *Roads.*—The existing roads and cart-tracks will be maintained and progressively improved. 630

In case the Patramangalam scheme is taken up, a new road will be be formed connecting Odanthorai with Kallampalayam. 631

H. *Buildings.*—All departmental buildings will be kept in good repair. 632

Prescriptions are made to provide residential and office accommodation to the subordinate staff wherever necessary. 633 to 642

A well will be constructed at Odanthorai and Kallampalayam which are proposed to be developed at forest colonies. The existing wells in the Vellikaradu and 643 to 645

PARAGRAPHS.

Pethikuttai Reserved Forests will be deepened and maintained. Provision of sanitary arrangements to all subordinate quarters is prescribed.

Construction of a rest-house at Odanthorai is suggested. 646

I. *Rain guages*.—No rain guage will be constructed in place of the Niralai rain guage which will be submerged in the proposed Pillur Reservoir. 647

Installation of new rain guages at Odanthorai and Kallampalayam is prescribed. 648

J. *Bee-keeping and amelioration of hill tribes*.—The harmful nature of the prevalent crude methods of honey collection are deprecated. Installation of apiaries in each settlement in the Mettupalayam Range is suggested. The person drawn from the concerned settlement will be entrusted in this work under the supervision of a forester trained in Bee-keeping. 649 to 652

K. *Planting of shade trees in the Mettupalayam timber depot*.—Prescriptions are made to plant seedlings of *Thoongumoonji maram* in the Mettupalayam Timber Depot to serve for shade. 653

L. *Preservation of wild life*.—Strict measures will be taken to prevent any illicit shooting. 654 and 655

Planting of *Ficus* cuttings and sowings of *Kaddapay* along the Bhavanisagar Reservoir will be done in order to increase the bird population. 656

M. *Control*.—Details regarding the maintenance of control book, record of works, register of deviations, control maps and control journals are given. 658 to 666

N. *Plantation and nursery journals*.—Instructions regarding maintenance of plantation and nursery journals wherever artificial regeneration operations are involved are given. 667 to 670

Chapter X—Establishment and Labour.

Establishment.—If the suggestion to divide the Mettupalayam section into two is implemented, one additional Forester will be necessary. If the proposal to instal apiaries in each *Irular settlement* is given effect to, one Forester and 14 apiary watchers will be required. 671 to 674

Labour.—Suggestions to improve the amenities provided to the labour colony in Odanthorai are made in order to attract more labour. 675 and 676

APPENDIX I.

Statement showing the yearly rainfall in centimetres recorded at some of the important stations in the Mettupalayam and Bhavani Ranges.

Name of the station.	1950.	1951.	1952.	1953.	1954.	1955.	1956.	1957.	1958.	1959.	1960.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Bhavani Sagar	*	83·16	24·95	92·77	78·34	52·58	59·91	78·62	74·51	65·83	80·01
Mettupalayam	58·63	73·01	50·70	53·97	87·07	85·75	79·68	124·26	84·24	82·85	87·58
Chennimalai	*	*	*	*	*	68·79	83·41	55·00	80·29	*	*

* Not available.

APPENDIX II.

List of Reserved Forests.

Serial number and name of Reserved Forests.	*Area in* Acres.	*Area in* (Hectares).	*Board's proceedings communicating the section 16 notification.*	*Notification number and date.*	*Page in Fort St. George Gazette.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
				(a) METTUPALAYAM RANGE.		
1. Nellithorai and Sundapatti Reserved Forest.	10,698·70	(4,329·50)	3104/F 62, dated 13th November 1885.	309, dated 4th November 1885.	Page 747, dated 8th November 1885.	With effect from 15th March 1914.
	10,197·96	(4,127·01)		Amended notification No. 75, dated 27th January 1914.	Page 211, dated 17th February 1914.	With effect from 1st March 1914.
Disafforested ..	40·85	(16·53)	....	77, dated 27th January 1914.	Page 212, dated 17th February 1914.	With effect from 15th March 1914.
Addition	7·63	(3·08)	....	89, dated 2nd February 1914.	Page 258, dated 22nd February 1914.	Do.
Do.	533·96	(216·03)	....	101, dated 15th January 1917.	Page 227, dated 20th February 1917.	With effect from 1st March 1917.
	10,698·70	(4,329·50) *				

2. Hulikaldurg Reserved Forest.	6,411·00	(2,594·46)	....	117, dated 23rd March 1886.	Page 339, dated 7th April 1886.	With effect from May 1886. Revised boundary description published in Notification No. 4, dated 3rd January 1899 and published at page 13, Part I of the *Fort St. George Gazette*, dated 3rd January 1899. To take effect from 3rd January 1899. Out of 6,411 acres, only an area of 2,643·96 acres has been transferred to Coimbatore North Division—*Vide* Notification in page 79.
Hulikaldurg Reserved Forest.	2,643·96	(1,069·97)	....	*Vide* Notification No. 244, dated 16th July 1920 and Notification No. 126, dated 23rd February 1920.	Page 79, dated 23rd February 1920.	With effect from 15th August 1920.
3 Melur slopes Reserved Forest.	3,743·97	(1,514·13)	....	285, dated 2nd May 1893.	Page 512, dated 9th May 1893.	With effect from 1st September 1893. Transferred to Coimbatore North—*Vide* Notification No. 126, dated 23rd February 1920—*Vide* page 79 for areas.
Addition — —	14·38	(5·83)	....	213, dated 16th August 1934.	Page 1454, dated 21st August 1934.	With effect from 1st September 1934.
Do. — —	14·38	(5·83)	....	435, dated 31st August 1936.	Page 1236, dated 8th September 1936.	With effect from 15th November 1936.
	3,772·73	(1,526·74) *				
4. Jaccanare slopes Reserved Forest.	6,442·06	(2,607·02)	....	152, dated 12th April 1892.	Page 507, dated 26th April 1892.	With effect from 30th June 1892.
Disafforested —	25·84	(10·44)	....	421, dated 18th September 1908.	Page 832, dated 6th October 1908.	With effect from 1st November 1908 transferred to Coimbatore district—*Vide* Notification No. 126, at page 79, G.O. No. 2625, Revenue, dated 18th September 1908.
5. Nilgiri Eastern slopes	28,140·00	(11,387·98)	.....	87, dated 5th March 1886.	Page 103, dated 17th March 1886	With effect from 31st March 1886.
				Revised notification No. 328, dated 9th July 1900.	Page 1083, dated 17th March 1900.	With effect from 9th July 1900.
	28,140·00	(11,387·98)		Amended notification No. 479, dated 26th October 1906.	Pages 1121–1122 of the *Fort St. George Gazette*, dated 30th October 1906.	For the common boundary between Coimbatore North and the Nilgiris district—*Vide* Notification No. 204, dated 30th May 1932.
					Page 985, dated 7th June 1932.	....

* Denotes the present area of the reserved forest.

APPENDIX II—*cont.*

List of Reserved Forests—cont.

Serial number and name of Reserved Forests.	*Area in* *Acres.*	*Area in* *(Hectares).*	*Board's proceedings communicating the section 16 notification.*	*Notification number and date.*	*Page in Fort St. George Gazette.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
6. Pillur slopes	3,749·01	(1,517·19)	....	73, dated 15th March 1894.	Page 187, dated 20th February 1894.	With effect from 15th May 1894. For the correct area of the reserved forest transferred to this district—*Vide* Pages 74, Notification No. 244, dated 16th July 1920.
7. Constantia	34·90	(15·15)	....	206, dated 27th April 1891.	Page 383, dated 5th May 1891.	With effect from 15th July 1891. Transferred to Coimbatore district—*Vide* No. 205, dated 8th July 1922.
8. Sandalwood Reserved Forest I.	14·20	(5·70)	....	19, dated 26th December 1901.	Page 23, dated 7th January 1902.	With effect from 15th April 1902. Transferred to Coimbatore district—*Vide* Notification No. 205, dated 8th July 1922 (Page (101).
9. Sandalwood Reserved Forest II.	38·64	(15·68)	....	288, dated 24th July 1926.	Pages 1808 and 1809, dated 31st July 1926.	With effect from 1st October 1902. Transferred to Coimbatore district—*Vide* Notification No. 205, dated 8th July 1922 (page 101).
10. Aduthurai Reserved Forest.	789·95	(319·68)	....	276, dated 2nd October 1885.	Page 646, dated 2nd October 1885.	....
Disafforested ..	10·15	(4·11)	....	422, dated 18th September 1908.	Page 832, dated 6th October 1908.	With effect from 1st November 1908 (for Nilgiri Railways).
	(779·80)	(315·5)				
11. Aduthurai Addition I.	35·42	(14·33)	....	178, dated 25th April 1905.	Page 348, dated 2nd May 1905.	With effect from 1st August 1905.
Disafforested ..	0·94	(0·37)	....	75, dated 12th October 1918.	Do.	With effect from 15th December 1918.
Do.	3·41	(1·37)	....	193, dated 30th May 1929.	Page 1168, dated 11th June 1929.	With effect from 1st July 1929.
	31·07	(12·57)*				
12. Aduthurai Addition II.	58·17	(23·54)	....	263, dated 5th July 1904.	Page 664, dated 5th July 1904.	....

13. Kallur Reserved Forest (Portion.)	387·84	(166·94)	....	206, dated 27th April 1891.	Page 382, dated 5th May 1891.	Add area of S.F. No. 266 B/1 originally to include—*Vide* R.Dis. 1/28 of the District Forest Officer, Nilgiris. Out of the whole of 393·94 acres a portion, viz., Bamboo coupes 3, 4, 5=245 acres has been transferred to Coimbatore North—*Vide* Notification No. 626, dated 16th September 1937, at page 112 of the *Fort St. George Gazette*.
Addition ..	6·10	(2·45)	....	....	....	....
	393·94	(159·39) *				
14. Kallar Reserved Forest	780·48	(315·85)	....	276, dated 15th September 1885.	Page 640, dated 2nd October 1885.	With effect from 15th September 1885.
Disafforested ..	31·57	(12·75)	....	183, dated 26th April 1899.	Page 26, dated 4th January 1899.	With effect from 15th September 1899. Amended notification No. 184, dated 26th April 1899, page 472, dated 2nd May 1899.
Disafforested ..	34·52	(13·97)	....	422, dated 18th September 1908.	Page 838, dated 6th October 1908.	With effect from 15th October 1908. G.O. No. 2625, R.W., dated 18th September 1908. An area of 21·8 acres was transferred to Agriculture department—*Vide* G.O. No. 2690, Dev., dated 21st November 1940.
	714·39	(287·49) *				
15. Kallar Addition I and II.	257·84	(104·34)	....	193, dated 16th April 1891.	Page 352, dated 28th April 1891.	With effect from 1st June 1891.
Area of Kallar Main.	714·39	(289·11)	....	206, dated 27th April 1891.	Page 382, dated 5th May 1891.	With effect from 15th July 1891 (Pa[illegible]e No. 120).
	972·23	(393·45) *				
16. Odanthorai Reserved Forest.	6,112·00	(2,473·47)	....	309, dated 4th November 1885.	Page 748, dated 4th November 1885.	....
....	..	..	B.P. No. 6, dated 10th January 1913.	9, dated 21st December 1912.	Page 32, dated 7th January 1913.	G.O. No. 3817, R.W., dated 21st December 1912—boundaries amended. (Handed over to panchayat management in 1926–27 but reverted back to the department in 1951).
Disafforested ..	45·10	(18·25)	....	119, dated 14th July 1923.	Page 775, dated 24th July 1923.	With effect from 1st October 1923.
Do.	240·00	(97·12)	....	317, dated 23rd November 1934.		G.O. No. 2425, R.W., dated 23rd November 1934.
Do.	15·48	(6·26)	....	429, dated 25th August 1936.	Page 1207, dated 1st September 1936.	With effect from 1st July 1937.
	5,811·42	(2,351·81) *				

* Denotes the present area of the reserved forest.

APPENDIX II—*cont.*

List of Reserved Forests—cont.

Serial number and name of Reserved Forests. (1)	Area in *Acres.* (2)	Area in *(Hectares).* (3)	*Board's proceedings communicating the section 16 notification.* (4)	*Notification number and date.* (5)	*Page in Fort St. George Gazette.* (6)	*Remarks.* (7)
17. Modur and Pethikuttai	5,804·80	(2,349·14)	....	309, dated 4th November 1885.	Page 748, dated 14th November 1885.	With effect from 1st January 1886. (Handed over to Panchayat management during 1926–27 and reverted back to the department in 1951).
Addition	18·70	(7·57)	....	323, dated 1st July 1912.	Page 709, dated 16th July 1912.	With effect from 1st September 1912.
Amended	5,823·50	(2,356·76)	....	86, dated 11th February 1913.	Page 259, dated 11th February 1913.	With effect from 11th February 1913.
Do.	7·64	(3·09)	....	95, dated 9th February 1915.	Page 215, dated 2nd March 1915.	With effect from 15th April 1915.
Disafforested ..	683·87	(276·63)	....	54, dated 24th January 1935.	....	(Correct area as per erratum 4, dated 16th March 1937). Remarks of the District Forest Officer, dated 12th November 1951. Only the correct area as per erratum published at page 452 of *Fort St. George Gazette* of 16th March 1937 has been deducted on previous page and hence no addition of 48 acres necessary. The correct area of the Reserved Forest is now 5,147·57 acres.
	5,147·57	(2,083·17) *				
18. Nellimalai	1,879·92	(760·78)	....	32, dated 20th January 1900.	Page 94, dated 23rd January 1900.	With effect from 1st May 1900. (Handed over to Panchayat management during 1926–27 and reverted back to the department in 1951).
Amended	1,879·92	(760·78)	....	87, dated 11th February 1913.	Page 259, dated 4th March 1913.	....
Addition	2·41	(0·97)	....	307, dated 27th September 1920.	Page 1257, dated 5th October 1920.	With effect from 1st December 1920.
Disafforested ..	568·38	(229·99)	....	68, dated 14th February 1922.	Page 201, dated 21st February 1922.	*Notification I.*—Under section 24 of the Madras Forest Act of 1882 (Act V of 1882) the Governor-in-command is pleased to declare that the area specified below which was declared to be reserved forest under section 16 of the Act in notification No. 32, dated 20th January 1900 is disreserved. Published in *Fort St. George Gazette*, page 94, dated 23rd January 1900.

Do.	1·90	(0·76)	....	37, dated 11th February 1913.	Page 259, dated 4th March 1913.	With effect from 10th March 1932 vide Coimbatore Collector's No.15585/30 B 5, dated 11th May 1932. D.F.O's. R.Dis. No. 1115/32, dated 20th May 1932.
	1,312·10	(530·95) *		Amended notification No. 122, dated 23rd February 1932.	Page 468, dated 1st March 1932.	
				(b) BHAVANI RANGE.		
19. Velamundy Reserved Forest.	18,415·15	(7,542·42)	....	174, dated 20th June 1885.	Pages 453 to 455, dated 7th July 1885.	With effect from 1st August 1885. (Handed over to Panchayat management during 1926–27 and reverted back to the department in 1951).
Disafforested ..	2,123·00	(859·15)	....	247, dated 26th May 1897.	Pages 712 and 713, dated 15th June 1897.	With effect from 15th July 1897.
Amended	16,292·15	(6,593·26)	....	473, dated 23rd September 1897.	Pages 1240 to 1243, dated 12th October 1897.	....
Addition	6·07	(2·45)	B.P. No. 15, dated 13th June 1903; G.O. No. 1144, R.W., dated 20th December 1902.	466, dated 20th December 1902.	Page 1301, dated 23rd December 1902.	With effect from 15th April 1902.
Disafforested ...	3·60	(1·45)	....	52, dated 17th January 1912.	Page 135, dated 30th January 1912.	With effect from 1st March 1912.
Addition	3·15	(1·27)	....	48, dated 1st January 1913.	Page 139, dated 4th February 1913.	With effect from 1st March 1913.
Amended	16,297·77	(6,595·54)	....	171, dated 2nd April 1913.	Pages 419 and 420, dated 22nd April 1913.	....
Disafforested ..	3,806·40	(1,216·66)	....	431, dated 30th August 1915.	Page 940, dated 28th September 1915.	With effect from 1st October 1915.
Do.	1,582·94	(640·36)	....	674, dated 13th July 1953.	Page 1047, dated 22nd July 1953.	District Forest Officer's No. 2950/51C.
Disafforested— Bit I .. 240·42, Bit II .. 20·81 = 261·23	261·23	(105·78)	....	207, dated 13th April 1955.	Page 582, dated 27th April 1955.	District Forest Officer's Nos. 2950/51 and 1324/53 C.
	10,697·20	(4,329·04) *				

* Denotes the present area of the reserved forest.

APPENDIX II—*cont.*

List of Reserved Forests—cont.

Serial number and name of Reserved Forests.	Area in Acres.	Area in (Hectares).	Board's proceedings communicating the section 16 notification.	Notification number and date.	Page in Fort St. George Gazette.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
10. Voipadi Reserved Forest.	442·60	(179·11)	....	145, dated 18th March 1898.	Page 25, dated 22nd May 1898.	Attached to Coimbatore North from 1st December 1951. (Handed over to Panchayat management during 1926–27, but reverted back to the department in 1951).
Deduct	3·16	(1·27)	....	....	....	(*Deduct* area found in decree during resettlement attached in Coimbatore North from 1st December 1951).
	439·44	(177·83) *				
11. Arachalur	1,086·03	(439·50)	..	568, dated 26th November 1896.	Page 1484, dated 1st December 1896.	Attached to Coimbatore North from 1st December 1951. (Handed over to Panchayat management during 1926–27 but reverted back to this department in 1951).
Deduct	2·29	(0·93)		....	....	*Deduct* area found as deficit during resettlement.
Disreserved	1·43	(0·57)	....	344, dated 25th June 1955.	Page 988, dated 6th July 1955.	....
	1,082·31	(437·99) *				
12. Sennimalai Reserved Forest.	1,842·14	(735·50)	....	222, dated 5th May 1900.	Page 671, dated 15th May 1900.	Attached to Coimbatore North from 1st December 1951. (Handed over to Panchayat management during 1926–27 but reverted back to this department in 1951).
Addition	12·81	(5·18)	....	634, dated 24th November 1910.	Page 1844, dated 6th December 1910.	....
	4·86	(1·96)	....	....	....	*Add* area found in excess during resettlement.
Disreserved	59·28	(23·99)	....	517, dated 21st November 1917.	Page 1376, dated 11th December 1917.	....
Boundaries amended.	1,786·28	(722·89)	....	518, dated 21st November 1917.	Pages 1376 and 1377, dated 11th December 1917.	....

Disreserved	84·84	(34·33)	....	231, dated 23rd August 1923.	Page 938, dated 28th August 1923.	....
Do.	21·31	(8·61)	....	251, dated 9th May 1955.	Pages 753 and 754, dated 25th May 1955.	G.O. Ms. No. 1280, Agriculture, dated 9th May 1955.
	1,680·13	(679·92) *				
33. Vellikaradu	280·73	(113·60)	....	565, dated 26th November 1896.	Page 1464, dated 1st December 1896.	....
Deduct	2·30	(0·93)	....	....	....	Area found as deficit during resettlement.
	278·43	(112·68) *				
34. Kongampalayam ..	455·57	(184·36)	....	215, dated 18th May 1897.	Page 645, dated 25th May 1897.	....
Disafforested ..	212·55	(86·01)	....	349, dated 18th December 1928.	Page 1896, dated 11th December 1928.	....
Disreserved	0·06	(0·02)	....	102, dated 12th April 1933.	Page 683, date4 25th April 1933.	....
	242·96	(98·21) *				

* Denotes the present area of the reserved forest.

APPENDIX III.

Rights and Concessions.

(a) *Mettupalayam Range.*

Serial number and name of Reserve. (1)	Rights and concessions. (2)
1. Hulikal drug Reserved Forest ..	The following rights of way have been admitted in this reserve (viz) :— (1) The footpath from Coonoor river to Kavalkombai estate. (2) The bridle path from the Lower Drug estate to Mettupalayam. (3) The bridle path from Kennimade estate to the Upper Drug estate. (4) The Kurumbars of Kavalkombe congadu yerkambay have been allowed the privilege of collecting honey, roots, etc., in this reserve subject to conditions.
2. Melur Slopes Reserved Forest ..	The following rights of way are admitted :— (1) Thaimalai-Bhavani Valley bridle road for men and cattle. It enters the reserve at a point which is about a chain south of the north-east corner of No. 350, passes first in an easterly direction, then southerly and again eastwards and towards north and passes the reserve in a general south-easterly direction and leaves it at the Coimbatore district boundary at a point which is about twenty-eight chains along that boundary from the point where the Nagappashola Nalli river crosses that boundary. The length of the road within the reserve is two miles and six furlongs and breadth nine feet. (2) A bridle path for men and cattle from Manar estate No. 331 to Parali Irulars' village. It enters the reserve at a point which is eight chains west of the south-east corner of No. 330, passes in an easterly direction and leaves the reserve at the Coimbatore district boundary at a point which is about ninety-one chains along that boundary from the point of exit of Right of Way No. 1. Length within the reserve—one mile, one furlong and thirty yards. Breadth six feet. (3) A bridle road from Manar estate to Virakal and Naipanai Irulars' village for men and cattle. It enters the reserve at a point twenty chains east of the south-west corner of No. 330, passes generally in a southerly direction and leaves the reserve on the Coimbatore district boundary at a point which is about one hundred and twenty chains along that boundary from the point of exit of right of way No. 2. Length one mile, one furlong and forty yards, and breadth six feet. (4) A bridle road called Sullivans' road for men and cattle. It leads from Sultana estate to Manar and other villages in the Coimbatore district. It enters the reserve at a point where the eastern boundary of No. 343 intersects the boundary of reserve; runs nearly due south till it enters the Coimbatore district boundary at a point which is about one hundred and thirty six chains along that boundary from the point of exit of right of way No. 3. Length within the reserve one mile, two furlongs and forty yards, and breadth nine feet. (5) A Kurumber's footpath from Munja combai in Balakola village to Mulli combai field No. 347 and thence to the low country. It enters the reserve at

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(a) *Mettupalayam Range*—cont.

Serial number and name of Reserve. (1)	Rights and concessions. (2)
2. Melur Slopes Reserved Forest—*cont.*	a point which is twenty-seven chains west of the boundary of field No. 78 of Melur village; goes generally in a southerly direction, the south-west to No. 347 where it leaves the reserve, again entering it near the south-eastern corner of No. 347, passes generally in a southern direction and leaves at the Coimbatore District boundary at a point which is eight chains north-east to the point of the junction of the Coimbatore, Nilgiris and Malabar districts. Length within the reserve two miles, one furlong and sixty yards, and breadth three feet.
	(6) A Kurumbar footpath for men only from 'Middle Kotakal estate' No. 371 to the footpath from Munja combai to the low country (Right of way No. 5). It enters the reserve near the south-west corner of No. 371, passes westerly and meets right of way No. 5, field No. 347-1. Length four furlongs and breadth three feet.
	(7) The right to a Badaga temple called Gopi temple in favour of the general public. It is situated near the northern boundary of the reserve and it is used by the Badagas and Kurumbars. One-fourth of an acre of land allround the said temple is excluded from reservation and a right of way admitted in favour of general public from field No. 436 of Balakola village to the temple. Length of the path one hundred yards and breadth five feet.
3. Pillur Slopes Reserved Forest ..	The following rights are admitted:—
	(1) A bridle road for men and cattle (general public) from Chengal estate of Mettupalayam. It enters the reserve at a point eight chains due east of the most southerly corner of No. 291, first running almost due south, then almost due east till it leaves the Coimbatore district boundary at a point about twenty-two chains along that boundary east of the point. When the Chengal stream crosses the boundary again entering the reserve at a point about three chains east of the last named point and passing almost due east leaves the reserve at the Coimbatore district boundary at a point which is twenty-eight chains west along that boundary from the point where the Kulkadavu pallam crosses that boundary. Length two miles and four furlongs, breadth six feet.
	(2) A bridle road from Lower Pillur estate to Mettupalayam for men and cattle. It enters the reserve at a point ten chains north-east of the most eastern corner of No. 306 C, passes generally in a south-easterly direction and leaves the reserve at the Coimbatore district boundary at a point along that boundary about seventy chains west of the point where the Chengal stream crosses the boundary. Length two miles and four furlongs, breadth six feet.
	(3) A bridle path for men and cattle from Chengalcombai estate of Mettupalayam, entering the reserve at the 2nd demarcation stone of the eastern boundary of field No. 301 A.B. counted from its south-east corner running almost parallel to the eastern boundary of No. 305 in a southerly

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(a) *Mettupalayam Range*—cont.

Serial number and name of Reserve. (1)	Rights and concessions. (2)
3. Pillur Slopes Reserved Forest—*cont.*	direction and leaving the reserve at the Coimbatore District boundary at a point eight chains along that boundary east of the point where the Chengal combai stream crosses that boundary. Length one mile and two furlongs, breadth six feet.
	(4) The Chengal combai bridle path for men and cattle. It enters the reserve at a point seven chains north-west of the south west corner of No. 297 A, leaves the reserve at the said corner, re-enters the reserve at a point about nine chains east of the said corner and again leaves it at a south-easterly direction and leaves it at a point on the western boundary where the channel combai stream enters that estate. Length within the reserve one mile four furlongs and one hundred and twenty-nine yards, breadth six feet.
4. Constantia Reserved Forest ..	The following rights of way are admitted :—

A right of way for men and cattle over a bridle road from Kunjapanai to Kolikarai starting at the northern corner of field No. 228A passing towards the north and ending near the eastern corner of field No. 204 A.

Length	..	..	..	10 chains
Width	..	..	..	1½ yards

Again entering the north-west corner of field No. 9c, passing through field numbers 9c, 9p (Outside the reserve) 27-1-28 29A (Outside the reserve) and ending near the Northern corner of field No. 86.

Length	..	..	..	33 chains
Width	..	..	..	3 yards.

(2) A right of way for men only over a foot path of Kagala commencing at the north-west corner of field No. 24c and 28 and ending near the northern corner of field No. 86.

Length	..	..	..	28 chains
Width	..	..	..	1½ yards.

(3) A right of way for men only over a foot path to field No. 35 starting at a point 4 chains from the south-western corner of field No. 3 A passing in a southerly direction through the wooded portion of field No. 28 and ending at a point 2 chains from the north-western corner of field No. 35.

Length	..	..	..	15 chains
Width	..	..	..	1½ yards

5. Sandalwood Reserved Forest .. I. The following right is admitted within the reserve:—

The right to use the ruined Irula temple and the surrounding ground for a radius of 10 yards for religious ceremonies is permitted. This temple lies in survey No. 245 at a point 100 links north-west of the eastern most point of that survey number.

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(a) *Mettupalayam Range*—cont.

Serial number and name of Reserve.	Rights and concessions.
(1)	(2)
5. Sandalwood Reserved Forest—*cont.*	II. The following rights of way are also admitted. They are 10 yards wide and are open to men and animals :— (1) Footpath from Kolikarai to Kunjapanai entering the Reserve at the south west corner of survey No. 245 of Jaccanare village and following the south-eastern boundary of that survey number (within the survey number) to its most easterly corner. (2) Footpath leading to Clovelly estate and branching from No. 1 above, 500 links east (measured along right of way No. 1) of the south-westc orner of survey No. 245 of Jaccanare village passing in a north-westerly direction for a distance of 500 links through the reserve and leaving the reserve at a point on the western boundary of Survey No. 245, 435 links north of the south-west corner of that survey number. (3) Footpath leading to Thutiyorai village and branching from No. 1 above 690 links south-west (measured along the right of way No. 1) of the most westerly corner of survey No. 245 of Jaccanare village and passing for a distance of 810 links through the reserve leaving it at a point on the north-west boundary of survey number 245 of Jaccanare village 330 links north-west of the most easterly point of that survey number. (4) Footpath from Thutiyorai village entering the Reserve at a point on the north-east boundary of survey No. 245 of Jaccanare village 560 links north-west of the most easterly point of that survey Number and passing through the reserve for a distance of 90 links in a westerly direction to the ruined Irula temple.
6. Aduthorai Reserved Forest ..	The following rights of way have been admitted in the Reserve :— (1) The Bridle path from Kallar to Hillacarry and then the footpath to Mourtrie estate. (2) The nine Kurumbars living in S. F. No. 103 have been allowed the privilege of collecting honey, roots and wood subject to the same conditions as were made with respect to Kurumbars in the Kallar Reserve, *vide* clause (*d*) of the remark column of that reserve.
7. Aduthorai Addition Reserved Forest I.	The undermentiond rights of way are allowed within the block for the people and cattle to a width of three yards. (1) Bridle path running through the block south-east of the Adderly Bungalow. It enters the block about three chains north-east of the western most corner of the block half a chain north-east of the same corner. (2) Bridle path from Adderly upper estate to the pulp house. It enters the block about one and three quarter chains north of the south-east corner of settlement No. 128 and running south-east, leaves it three quarters of a chain east of the said corner.

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(a) *Mettupalayam Range*—cont.

Serial number and name of reserve. (1)	Rights and concessions. (2)
8. Aduthorai Addition Reserved Forest II.	(*a*). The undermentioned rights of way are allowed within the block.— *Foot path.*—Path three feet wide open for men only from Marikkodu-kombai to Adderly estate. It enters the block two and a half chains north-west of the north-east corner of the block and running west and then south-west leaves about nine and a half chains south-east of the north-west corner of the block. (*b*) The undermentioned temple is demarcated out free from reservation and left as an enclosure within the block with a vacant space etc., noted against it— Kurumbarmata Davara a rock situated about ten chains east of the western most corner of the block with a vacant space of one and a quarter chains on each side of it with a right to worship at this place where Kurumbars gather there once a year in large numbers for the purpose. To be approached by a path three feet wide open for men only, branching from path A *supra* about nine chains east of the temple and running west to it. Right is allowed to use the water of a pool (for temple purpose) situated just where the path to this temple branches from the path A.
9. Kallar Reserved Forest	*Record of rights.*-The following right of way is admitted:— A right of way for men and cattle (pack bullocks) over a foot path from Upper Kallar estate to Kallar starting near the southern corner of field No. 46 (*a*) passing through fields Nos. 261 and 95 and ending near the north-eastern corner of field No. 255. Length .. .. 2 miles. Width .. .. 1½ yards. Copy of the Proceedings Ms. No. 404, dated 10th July 1930, from the Chief Conservator of Forests, Madras. Under section 18 of the Forest Act, the Chief Conservator of Forests permits the Public Works Department to do all acts of necessary things for the maintenance of the Ootacamund-Mettupalayam road passing Reserved Forests of and within this area extending to 75 feet on either side from the centre of this road. No right is conferred to any form of forest produce and where any tree growth is cut, the fact should be reported to the forest authority, whose business it will be to take charge or he may allow trees to be disposed of through the agency of the Public Works Department. Sandal and valuable timber however should not be disposed of in this manner. G.O. No. 2090, Development, dated 21st November, 1940. *Order*—The Agricultural Department requires an area of 21·8 acres in coupe III of Kallar Reserved Forest for the extension of the Kallar gardens. Of this area, 10 acres were handed over to that department in 1901. His Excellency orders to hand over the remaining area of 11·8 acres to that Department subject to the following conditions:— (*i*) That the work of clearing sandal in the area if and when necessary should be entrusted to the Forest Department and should not be sold to private contractors for removal.

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(a) *Mettupalayam Range*—cont.

Serial number and name of reserve. (1)	Rights and concessions. (2)
9. Kallar Reserved Forest—*cont.*	(*ii*) That the northern and eastern boundaries should be effectively demarcated by a fifteen feet cleared line and cairns and, (*iii*) That the lines should be properly maintained by clearing at least three times a year, the cost of which should be borne by the Agricultural Department.
10. Nilgiri Eastern slopes Reserved Forest.	Rights and concessions :— Under provision (a) of section 21 of the Madras Forest Act of 1882, permission is hereby granted to Mr. Handerson of Kokode estate to construct a cart track from Gandan to Ulliyur and 6′ bridle path from Ulliyur to Kokode as per sketch attached subject to the following conditions :— 1. A free licence to use the road and bridle path must be taken out and renewed annually. 2. That the Forest Department has full right over the road in every way. 3. That this cart track and bridle path are kept in a good state of repairs to the satisfaction of the District Forest Officer. 4. That the cart track and bridle path are only used for the purpose for which they are intended (i.e.,) legitimate estate purpose. 5. That all the trees, bushes, etc., cut during the marking of the cart-track and bridle path are handed over to the Forest Department for disposal. No sandal tree to be cut or removed until it has been marked by a Forest Officer who will be deputed for the purpose as soon as the track is ready.
11. Jaccanare Reserved Forest ..	Notification No. 69, dated 8th February, 1935 of the Chief Conservator of Forests, Madras. Under section 18 of the Madras Forest Act (V of 1882) the Chief Conservator of Forests admits in favour of the general public, the right to worship at the two Irula Mariamman temples, illustrated in the sketch attached and described in detail in the schedule below in Jaccanare slopes Reserved Forest (Notified under section 16 of the Act in Notification No. 152, dated 12th April, 1892 published at page 507 of Part I of the *Fort St. George Gazette*, dated 26th April, 1892.]
12. Nellimalai Reserved Forest ..	*A*. The undermentioned rights of way are allowed within the block.— 1. Cart-track from Mettupalayam to Nellithorai twelve feet wide and open for people, carts and cattle. It enters the block one chain south of the north-west corner of S. No. 105 of Thasanur and running in a south-westerly direction 114·60 chains and leaves it at the causeway over the Bhavani to Nellithorai. 2. Footpath from Thasanur to Nellithorai six feet wide and open for men and cattle. It branches from item A point seven chains from the point of extension of the path, runs for about one hundred and sixty chains, in a south easterly and easterly direction and leaves it at cairn No. 8. *B*. The undermentioned temple has been excluded from reservation and left as an enclosure within the block, access as noted under it.

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(*a*) ***Mettupalayam Range***—cont.

Serial number and name of reserve. (1)	Rights and concessions. (2)
12. Nellimalai Reserved Forest—*cont.*	Bathrakaliamman Koil to a space of twenty yards north to south and ten yards east to west. To be approached by path, six feet wide and open for men and sheep and goats taken for sacrifice. The path branches from item A1, *supra* its function with item A2 and thence south-east for about seven and a half chains to it.
	C. The undermentioned *patta* land is excluded from reservation and left as an enclosure within the block with access as noted against it.
	Village. S. No. Extent. Access.
	Nellithorai. 426 2·05 By item A, *supra* up to the western boundary of the block and then northwards along the boundary to the *patta* land open for *pattadar's* people, cattle and carts.
13. Odanthorai Reserved Forest ..	The road from Mettupalayam-Kilkotagiri Road to Lingapuram to a width of 33' is opened for men, cattle and vehicles for a total distance of 3 miles, 4 furlongs and 24 feet (Chief Conservator's Proceedings Reference No. 25241, dated 15th July 1961).

NOTE.—Particulars of rights and concessions allowed in the Nellithorai and Modur Pethikuttai reserves are not available.

14. Sennimalai Reserved Forest ..	*A.* The following rights of way have been admitted within the block :—
	1. A path to Subramaniyaswamy Kovil and Sanyasi-kugai (cave) from the bottom of the hill by a flight of steps to a width of eighteen feet open for people and cattle. It enters the block of Valliamman putham temple near the south side of S.F. No. 261 of C to C5 *supra* to item Chellipillayar kovil lies on the said path within the area allowed for it.
	2. Cart-track six yards wide and open for people, cattle and carts. It enters the block half a chain north of north-east corner of Survey No. 8 of Pudupalaiyam. Runs northwards through Survey No. 448 of Katampalaiyam for about 18 chains and join item B, about four chains south of the north-east corner of Survey No. 1 of Pudupalaiyam.
	B. The undermentioned local fund road from Sennimalai to Uttukuli is excluded from reserva tion to a width of forty-four yards. It enters the block three chains north of the south-west of Survey No. 82 of Pudupalaiyam and running first north-east for about thirty three chains and then north thirty-six chains east of Khandam station on the south side of Survey No. 510 of Sennimalai.
	C. The following temples have been excluded from reservation and left as enclosures within the block :—
	1. Elapathi Mantapam (Water shed) attached to the temple to a space of 1,600 square feet and the water shed to a space of 1,184 square feet (i.e.) thirty-seven feet east to west and thirty-two feet north to south.
	2. Sivan Kovil on the same path to a space of hundred square feet east to west and north to south twenty-five feet.

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(*a*) *Mettupalayam Range*—cont.

Serial number and name of reserve. (1)	Rights and concessions. (2)
14. Sennimalai Reserved Forest—*cont.*	3. Vembadi Vinayagar Kovil lying north on the same path to a space of two hundred and four square yards (i.e.) east to west twelve yards and north to south seventeen yards.
	4. Subramanyaswamy Kovil on the same path to space of nearly one acre (east to west 220 links and north to south 450 links). It is also approached by a path three yards wide and open for people and cattle. It enters the block on the north side of Survey No. 145 of Ekkatampalaiyam, two chains west of its north-east corner and runs north for about forty chains to the temple.
	5. Valliamman Kovil lying on path item A1 *supra*, to a space of 30½ cents nearly (east to west 130 links and north to south 235 links).
	6. *Sanyasi kugai* (cave) lying on the path item A1 *supra* to a space of 13·35 cents (i.e.), 150 links north to south on the west side and 159 links on the east side. 116 links east to west on the north side and sixty links on the south side. To be approached also by a path two yards wide and open for people and cattle. It enters the block on the north side of Survey No. 154 of Ekkatampalaiyam and runs north-east and north-west for about forty chains to the *Kugai* (cave).
	7. Kannimar and Vinayagar Kovil to a space of ten yards north to south and twenty yards east to west. This includes the reservoir called Mamangam lying close to the temple. Access to it will be by a path two yards wide and open for people only. It enters the block at the north-east corner of Survey No. 443, of Ekkatampalaiyam and runs northwards for thirty chains to the temple.
	D. Right to the use of the water in the following reservoirs is admitted.
	1. Pachapali reservoir three chains north-west of the north-east corner of Survey No. 508 of Ekkatampalayam with access by a path two yards wide and open for people and cattle. It enters the block at the north-east corner of the said Survey field and runs north-west to the reservoir.
	2. Reservoir in Survey No. 408 Ekkatampalayam with access by a path two yards wide and open for people and cattle. It enters the block at the north-west corner of Survey No. 459 of the said village and runs north to the Pool.
	3. Reservoir in Survey No. 456 of Ekkatampalayam with access by a path two yards wide and open for people and cattle. It enters the block at the south-east corner of Survey No. 454 and runs due north for about ten chains to the Pool.
	E. The undermentioned *patta* land has been excluded from reservation and left as an enclosure within the block.

APPENDIX III—*cont.*

Rights and Concessions—*cont.*

(*a*) *Mettupalayam Range*—cont.

Serial number and name of reserve. (1)	Rights and concessions. (2)
	Survey No. 86 of Pudupalaiyam, measuring 12·81 acres with access by item B, as far as odai poramboke and thence northward, along the odai by a path two yards wide and open for people and cattle.
15. Vellikaradu Reserved Forest ..	The undermentioned right of pay allowed within the Vellikaradu Block :—
..	(1) Cart track from Sennimalai-Uttukuli Road (Survey No. 71) to Karathupalaiyam and C Villages. It enters the block at its south-east corner and running northwards along the east side of Survey No. 120 leaves it at the south-east corner of Survey No. 121. It again enters along the eastern boundary of the block leaves it one chain east of the south-east corner of Survey No. 141, all of Punjappalatoluvu village. It will be six yards wide and open for people, cattle and carts.
..	(2) Cart track to the Vijayamangalam Railway Station. It enters the block at the north-west corner of survey No. 115 and running along the western boundary of the block, leaves it on the south side of Survey No. 156 about half a chain east of the north-east corner of Survey No. 132, all of Punjapalatoluvu village. It will be six yards wide and open for people, cattle and carts.
16. Kongampalaiyam Reserved Forest.	*A.* The undermentioned temples have been excluded from reservation and left as enclosure within the access under each :—
..	1. Arasatta Kovil on the top of Arasani hill in a *pucca* building about fifty feet square, to a space of half an acre around it for cooking olive offerings. To be approached by a flight of steps about two yards in width leading to it eastwards from the east side of Survey No. 91 of Kongampalaiyam. The path will be open for people only.
	2. Kolandaikumarar Kovil on the top of Arasani hill an enclosure of loose stones 10 feet × 8 feet to a space of quarter of an acre around it for cooking olive offerings. It lies on the path allowed to temple No. 1 *supra* about six furlongs from it.
	B. The *itteri* (path) comprised in survey No. 14, 13 and 6 and its continuation along the west and north side of Survey No. 4 all of Dalavoipalaiyam village, till it leaves the forest at the south-west corner of Survey No. 18 of that village is admitted as a public right of way to a width of six yards where it does not consist of surveyed and demarcated fields will be open for people, cattle and carts.
19. Arachalur Reserved Forest ..	*A.* The following rights of ways are allowed within the block :—
	I. Footpath to Vellodu and other villages at north-west corner of S. F. No. 1593 and runs northwards through S. F. No. 1601 and 1619 all of Arachalur village leaves the block on the southern boundary of Attanani, Ammanpathi villages. It will be two yards wide and open for people and cattle.

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(a) *Mettupalayam Range*—cont.

Serial number and name of reserve. (1)	Rights and concessions. (2)
19. Arachalur Reserved Forest ..	*A.* The following rights of ways are allowed within the block :—
....	II. Footpath running through S. F. No. 1550 and in continuation of it along the north side of S. Nos. 1549 and 1548 all of Arachalur to temples Nos. 1 and 2. It enters the reserve at the north-west corner of S. No. 1546, It will be two yards wide and open for people only.
....	III. Footpath to Arachalur shandy enters at the north-west corner of Survey No. 1474, runs within the block along the south side of Survey No. 1472 of Arachalur village and leaves the Reserve at the south-east corner of 1472 inside. It will be two yards wide and open for people and cattle.
....	*B.* The following temples have been excluded from reservation and left as enclosures within the block with access as noted against each.
	I. Kannimarkoil a building six feet square with a space of one acre situated at the foot of the hill and north of S. No. 1548. To be approached by path No. II *supra.* The right of people visiting the temple to take water from the reservoir lies within the temple enclosure.
....	II. Perumalkoil situated a furlong north-west of temple No. I with a space of two cents. To be approached by path No. II *supra.*
	III. Subramanyarkovil covering a space of five cents and situated at the top of the hill with a space of half an acre including the building. To be approached by a path running along the west side of Survey No. 1463, and through a flight of steps in Survey No. 1699, in a north-westerly direction for about a mile. This will be two yards wide and open for people only.
....	IV. Idumbankoil covering a space of one cent and situated about a chain east of temple No. III with a space of 5 cents including the building. To be approached by the path, allowed to temple No. III. The right to take water for temples No. III and IV from the reservoir lying about a furlong north of them is admitted as also the right of people visiting the temple to bathe in the reservoir with access to it by a path two yards wide and open for people only running northwards from the temple.
18. Voipadi Reserved Forest ..	*A.* The following temples, etc. have been excluded from reservation and left as enclosures within the block with access as noted against each :—
....	1. Komaran temple on the top of a hill called Komararkaradu. The temple consists of a walled space about four yards square covered with leaves, etc. during festivals. It is visited thrice a year by the villagers of Voipadi in Margali (December-January), Vaikasi (May-June) and Purattasi (September-October). There is a flat round the temple for about ten yards for people to stand during worship. To be approached by a path running westwards from Survey No. 302 (*Itteri*) to the foot of the hill and thence by the steps leading the temple. The path will be two yards wide up to the foot of the hill and open for people only.
....	

APPENDIX III—*cont.*

RIGHTS AND CONCESSIONS—*cont.*

(*a*) *Mettupalayam Range*—cont.

Serial number and name of reserve. (1)	Rights and concessions. (2)
18. Voipadi Reserved Forest	2. A cent of land on the hillock west-south-west of the said temple on the boundary between Voipadi and Thalavoyipalayam where the visitors to temple A1 *supra* worship, before doing so, in the said temple. To be approached by a path to temple A1 and a continuation of it to the hillock two yards wide and open for people only.
	B. The undermentioned rights of way are allowed within the block.—
	1. Path in Survey No. 446 of Thalavoyipalayam and No. 408 of Voipadi and its continuation eastwards along the north side of Survey No. 401 till it leaves the block about five and three-fourth chains south-east of the western most corner of Survey No. 423 (along Voipadi). Its width will be the same as that of the survey fields where they are separately surveyed and mapped and at other places two yards. It will be open for people and cattle. Its length within the block is about 4 furlongs.
	2. Path to *patta* land Survey No. 412 from path item B1 *supra* northwards along the western border of Survey No. 413 path of Voipadi village. It will be two yards wide open for people and cattle.
	3. Path to *patta* land Survey No. 421 from path B1 *supra* northwards along the eastern border of Survey No. 413 (all of Voipadi village). It will be two yards wide and open for people and cattle.
	4. Path two yards wide and open for people and cattle. It enters the reserve on the north side of Survey No. 372 about 2¼ chains from its north-west corner and running north-eastwards along the southern boundary of Survey No. 401 leaves it on the west side of Survey No. 302 (all of Voipadi village). Its length within the block is about 5 furlongs.

NOTE.—Particulars of rights and concessions in the Velamundy Reserved Forest are not available.

APPENDIX IV.

List of Teak plantations in the Mettupalayam Range with details of cost and profit account.

	Serial number and locality.	Year of formation.	Area in Acres.	Area in Hectares.	Revenue realised by sale of jungle growth.	Expenditure. I year.	Expenditure. II year.	Expenditure. III year.	Expenditure. IV year.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					RS. P.	RS. P.	RS. P.	RS. P.	RS. P.
1	Thattaipallam	1956	15·00	6·07	1,000·00	4,168·00	99·00	558·50	120·00
2	Do.	1957	20·00	8·09	Nil.	1,998·67	906·36	114·00	..
3	Odanthorai	1958	128·00	51·90	5,853·50	24,660·00	16,137·62	13,801·99	3,470·10
4	Do.	1959	172·00	71·70	Nil.	25,819·43	13,235·48	6,442·00	..
5	Do.	1960	114·00	46·14	Nil.	23,871·12	7,950·89	..	..
6	Do.	1961	100·00	40·47	4,202·50	18,332·97	..	..	..
7	Hulikal	1932	2·80	1·13	23·12	965·00	..	..	..
8	Do.	1933	5·00	2·02	25·00	843·42	..	..	..
9	Do.	1934	5·00	2·02	25·00	552·87	..	..	..
10	Do.	1935	2·00	0·81	15·00	290·06	..	..	..
11	Do.	1937	2·20	0·89	Not available.	470·87	..	..	..
12	Do.	1938	2·20	0·89	45·00	221.81	..	..	..
13	Do.	1939	2·00	0·81	48·56	190·31	..	..	..
14	Do.	1940	2·00	0·81	30·00	156·87	..	..	..
15	Do.	1942	5·30	2·14	140·00	51·56	..	..	..
16	Do.	1943	7·00	2·83	265·00	267·87	..	..	..
17	Do.	1944	5·00	2·02	700·00	401·50	..	..	..
18	Do.	1945	2·90	1·17	425·00	437·81	..	..	..
19	Do.	1946	2·80	1·13	150·00	147·81	..	..	..
20	Do.	1947	3·05	1·25	225·00	109·94	..	..	..
21	Do.	1948	2·90	1·17	1,067·50	207·37	..	..	..
22	Do.	1949	1·40	0·56	899·00	58·25	..	..	..

APPENDIX IV—cont.

List of Teak plantations in the Mettupalayam Range with details of cost and profit account—cont.

Serial number	and locality.	Expenditure. 1st thinning.	Expenditure. IInd thinning.	Total expenditure incurred in forming the plantation.	Revenue. From thinnings.	Revenue. From final fellings.	Total Revenue obtained.	Remarks.
		(10)	(11)	(12)	(13)	(14)	(15)	(16)
		RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	RS. P.	
1	Thattaipallam	..	..	2,082·67	..	..	..	..
2	Do.	..	..	3,019·03	..	..	..	..
3	Odanthorai	..	..	58,069·62	..	..	..	..
	Do.	..	..	45,588·08	..	..	..	..
	Do.	..	..	31,822·01	..	..	..	..
	Do.	..	..	18,332·97	..	..	..	..
7	Hulikal	128·00	..	1,093·00	1,408 37	6,700·69	8,109·06	Coppiced during 1956
	Do.	103·00	23·12	969·56	762·87	8,336·50	9,099·37	Do. 1957
	Do.	47·25	..	600·12	708·31	782·19	1,490·50	Do. 1958
	Do.	17·00	241·12	548·19	358·81	782·12	1,140·94	Do. 1959
	Do.	15·40	5·00	491·28	640·81	Converted produce not yet sold.	640·81	Do. 1960
12	Do.	13·81	18·50	254·12	808·75	Do.	808·75	Do. 1961
13	Do.	6·90	30·55	259·28	714.00	..	714·00	..
14	Do.	11·81	23·13	225·25	819·12	..	819·12	..
15	Do.	56·28	32·87	150·59	369·56	..	369·56	..
16	Do.	4·16	..	272·03	417·56	..	417·56	..
17	Do.	16·00	42·56	459·94	298·75	..	298·75	..
18	Do.	Not available.	53·00	505·09	315·50	..	315·50	..
19	Do.	5·00	Not available.	147·94	Not available.	..	..	..
20	Do.	4·00	12·00	126·94	66·25	..	66·25	..
21	Do.	14·78	3·00	214·06	18·75	..	18·75	..
22	Do.	3·22	..	61·47	28·12	..	28·12	..

APPENDIX V.

List of herbs, shrubs and trees commonly found in the Mettupalayam and Bhavani Ranges.

Botanical name.	*Tamil name.*
Abrus precatorius	Kundumani.
Abutilon indicum	Thuthi.
Acacia arabica	Karuvelam.
Acacia concinna	Shekoy.
Acacia ferruginea	Parambai.
Acacia intsia	Indu.
Acacia latronum	Anaimullu.
Acacia leucophloea	Velvelam.
Acacia planifrons	Kodaivelam.
Acacia suma	Othalai.
Acacia sundra	Karungali.
Achyranthes aspera	Nayuruvi.
Acrocarpus fraxinifolius	Malankonnai.
Adhatoda vasica	Adathodai.
Adina cordifolia	Manjakadambai.
Aegeratum conyzoides	Kattu samanthi.
Aegle marmelos	Vilvam.
Aerva lanata	Poolai.
Agave americana	Kathalai.
Ailanthus excelsa	Pimaram.
Alangium salvifolium	Alingi.
Albizzia amara	Unjal or Usil.
Albizzia lebbek	Vagai.
Albizzia odoratissima	Karuvagai.
Albizzia procera	Velvagai.
Allophyllus cobbe	Perrakudikai.
Anacardium occidentale	Munthri.
Anogeissus latifolia	Vellanagai.
Anona squamosa	Sithapazham.
Artocarpus heterophyllus	Palamaram.
Atalantia monophylla	Kattuelimichai.
Azadirachta indica	Vembu.
Barleria species	Kanakambaram.
Barringtonia acutangula	Kaddapay.
Bauhinia purpurea	Mandarai.
Bauhinia racemosa	Athi.
Bauhinia vahlii	Kattumandarai.
Bischofia javanica	Milachadayan.
Boerhaavia diffucta	Sattaranai.
Borassus flabellifer	Panaimaram.
Boswellia serrata	Kungiliam.
Boucerosia umbellata	Satharakalli.
Buchanania lanzan.	Saraiparuppu.
Bridelia retusa	Mulvengai.
Butea monosperma	Elaiporasu.
Butea superba	
Callicarpa lanata	Vettilai pattai.
Calophyllum elatum	Kattupinnai.
Calophyllum inophyllum	Punnai.

APPENDIX V—*cont.*

List of herbs, shrubs and trees commonly found in the Mettupalayam and Bhavani Ranges—cont.

Botanical name.	*Tamil name.*
Calycopteris floribunda	Pillani.
Canthium dicoccum	Pyrai or Nekkini.
Canthium parviflorum	Karai.
Capparis decidua	....
Capparis zeylanica	Athondai.
Carissa carandas	Kilakkai.
Cassia auriculata	Avaram.
Cassia fistula	Konnai.
Cassia siamea	Manjakonnai.
Cassia montana	Malayavaram.
Casuarina equisetifolia	Chavukku.
Chloroxylon swietenia	Porasu.
Chomelia asiatica	Pavattai.
Chuckrassia tabularis	Vedivembu.
Cinnamomum sulphuratum	....
Cissus quadrangularis	Perandai.
Citrullus colocynthis	....
Cleistanthus collinus	Odugan.
Clerodendron viscosum	Vattakanni.
Clitoria ternatea	Sankapushpam.
Cochlospermum religiosum	Thanuku.
Commiphora berryi	Mulkiluvai.
Commiphora mukul	Pachakiluvai.
Cordia dichotoma	Naruveli or Virusham.
Crataeva religiosa	Mavalingam.
Cryptolepis buchanani	....
Cycas circinalis	Kodai icham.
Cyperus rotundus	Korai.
Dalbergia sissoo	Sissoo.
Dalbergia latifolia	Itti or Thothagathi.
Dalbergia paniculata	Porapachalai.
Delonix elata	Vada mudukki.
Delonix regia	Mayir konrai.
Dendropthoe species	Pulluruvi.
Derris scandens	Yanaikellikodi.
Desmodium species	....
Dichrostachys cinerea	Vedathalam.
Dioscorea species	..
Diospyros melanoxylon	Thavarai.
Diospyros montana	Vakkanai.
Diospyros species	Thovarai.
Dodonaea viscosa	Virali.
Dolichandrone atrovirens	Pumpadri.
Drypetus sepiaria	Vellilumbu.
Elaeocarpus serratus	Rudraksham.
Elaeodendron glaucum	Kannirmaram.
Emblica officinalis	Nelli.
Entada phaseoloides	Cillu.
Erythoxylon monogynum	Sembulichan.

APPENDIX V—*cont.*

List of herbs, shrubs and trees commonly found in the Mettupalayam and Bhavani Ranges—cont

Botanical name.	*Tamil name.*
Eucalyptus hybrid	Nilagiri maram.
Euphorbia antiquorum	Kalli.
Euphorbia hirta	....
Euphorbia tirucalli	Tirucalli.
Euphoria longana	Shempuvan.
Feronia limonia	Vilamaram.
Ficus ctenghalensis	Ala maram.
Ficus hispida	Chona athi.
Ficus religiosa	Arasamaram.
Filicium decipiens	Athadali.
Flacourtia indica	Kattukala.
Flacourtia jangomas	Mullumukanchi.
Gardenia gummifera	Dekkamalli or Kambili pissin.
Gardenia turgida	Kambili.
Garuga pinnata	Karuvembu.
Gaultheria fragrantissima	Kolakkai.
Givotia rottleriformis	Boothalai or Vandalai.
Gloriosa superba	Kalappakizhangu.
Glycosmis pentaphylla	Kulapanai.
Gmelina asiatica	Vellakumil.
Gymnema montanum	Mahali kizhangu.
Gyrocarpus jacquinii	Kongelevam or Thanaku.
Hardwickia binata	Acha.
Helicteres isora	Valambiri.
Hemidesmus indicus	Nannari.
Hesperethusa crenulata	Kattu elimichai.
Hippocratea indica	Odankodi.
Hiptage benghalensis	Vennalan kodi.
Holoptelea integrifolia	Aya.
Ichnocarpus frutescens	Othal kodi.
Ilex denticulata	....
Ipomaea species	Krishnakranthi.
Jasminium species	Malligai.
Jatropha curcas	Kattamanakku.
Jatropha glandulifera	Adalai.
Lannea coromandelica	Odiyamaram.
Lantana camara	Puchedi.
Leucas aspera	Thumbai.
Litsea oleoides	....
Litsea stocksii	....
Maba buxifolia	Kattu thovarai.
Machilus macrantha	Kolarmavu.
Madhuca latifolia	Iluppai.
Madhuca longifolia	Iluppai.
Mallotus philippinensis	Kamala.
Mangifera indica	Mamaram.
Mesua ferrea	Nangu.
Mimosa pudica	Thottal surungi.
Mimusops elengi	Magadam or Mahila.

APPENDIX V—*cont.*

List of herbs, shrubs and trees commonly found in the Mettupalayam and Bhavani Ranges—**cont.**

Botanical name.	***Tamil name.***
Mitragyna parvifolia	Neerkadambu.
Morinda tinctoria	Nona.
Moringa oleifera	Murungai.
Mundulea sericea	Pullavaram.
Murraya koenigii	Karuveppilai.
Murraya paniculata	Kattukaruveppilai.
Nerium indicum	Arali.
Ocimum kilimandscharicum	Tulsi.
Opuntia dillenii	Sappathikalli.
Ormosia travancorica	Malaimanjadi.
Palaquium ellipticum	Pali or Palvadinjan.
Pandanus furcatus	Thazhai.
Parkinsonia aculeata	Kattumuringai.
Pavetta indica	Pavattai.
Pavonia zeylanica	Kurundoti.
Phoenix sylvestris	Eacham.
Pithecolobium dulce	Konapuliyan.
Polyalthia coffeoides	Nedunarai.
Pongamia pinnata	Pungam.
Prosopis julieflora	Seemai vanni.
Protium caudatum	Malankiluvai.
Pterocarpus marsupium	Vengai.
Pterolobium indicum	Karu indu.
Randia dumetorum	Karai.
Rhododendron arboreum	Pumaram.
Rubus lasiocarpus	Kolalindu.
Salmalia malabarica	Poola or Ilavu.
Samanea saman	Thoongumoonji maram.
Santalum album	Santhanam.
Sapindus emarginatus	Poochakottai.
Sesbania aculeata	Daincha.
Schleichera oleosa	Poovathi.
Scutia myrtina	Thoratti or Kokkimullu.
Securinega leucopyrus	Veppula.
Securinega virosa	Veppulathi.
Semecarpus anacardium	Shenkottai.
Shorea talura	Jalari maram.
Solanum pubescens	Sundai.
Solanum species	Kathirai.
Solanum trilobatum	Sundakkai.
Solanum verbascifolium	Mullikkai.
Solanum xanthocarpum	Kandankathiri.
Stereospermum personatum	Pupadiri.
Streblus asper	Kuttipila.
Strobilanthes species	Kurinji.
Strychnos potatorum	Thethankottai.
Symplocos laurina	Kamblivetti.
Syzygium cumini	Naval maram.

APPENDIX V—*cont.*

List of herbs, shrubs and trees commonly found in the Mettupalayam and Bhavani Ranges—cont.

Botanical name.	Tamil name.
Tamarindus indica	Puliyamaram.
Tectona grandis	Thekku.
Tephrosia species	Kolinji.
Thevetia peruviana	Thiruvachipu.
Terminalia arjuna	Nirmathi.
Terminalia belerica	Thani.
Terminalia chebula	Kadukkai.
Thespesia lampas	Kattuparuthi.
Thespesia populnea	Poovarasu.
Toddalia asiatica	Kattumilagu.
Trema orientalis	Ambaruthi.
Tridax procumbens	....
Ventilago madraspatana	Vembadam.
Viscum species	Ottu.
Vitex negundo	Nochi.
Vitex ultissima	Mayiladi.
Webera corymbosa	Pavattai.
Wrightia tinctoria	Palai.
Zizyphus glabrata	Karikattan.
Zizyphus mauratiana	Elandai.
Zizyphus oenoplia	Churimullu.
Zizyphus xylopyrus	Kottai elandai.

APPENDIX VI.

List of grasses commonly found in the Mettupalayam and Bhavani Ranges.

Botanical name.	Tamil name.
Aristida depressa	Oosipullu.
Aristida hyotrix	Oosipullu.
Bambusa arundinacea	Perumungil.
Bothriochloa pertusa	Chinnakaraipullu.
Brachiaria distachia	Murugullu pullu.
Brachiaria remota	Puliyampullu.
Cenchrus ciliaris	Kolukattai pullu.
Cenchrus setigerus	Kolukattai pullu.
Chloris polystachya	....
Chrysopogon fulvus	Sola pullu.
Cymbopogon citratus	Tharba pullu.
Cymbopogon flexuosus	Vasanai pullu.
Cymbopogon nardus	....
Cynodon dactylon	Arugam pullu.
Dactyloctenium aegyptium	....
Dendrocalamus strictus	Kalmungil.
Digitaria sanguinalis	....
Digitaria marginata	Arisi pullu.

APPENDIX VI—*cont.*

List of grasses commonly found in the Mettupalayam and Bhavani Ranges—cont.

Botanical name.	*Tamil name.*
Enteropogon monostachyus	Malaipullu.
Eragrostis bifaria	Seranaipullu.
Heteropogon contortus	Oosipullu
Panicum trypheron	.....
Perotis indica	Narival pullu.
Sehima nervosum	Kura itti.
Setaria pallidifusca	Korai pullu.
Sporobolus minutiflorus	.....
Tragus biflorus	Ottupullu.

APPENDIX VII.

CONTROL BOOK.

(*Common to all working circles, except Reserve Sandal, Minor Forest Produce and Grazing Working Circles.*)

Prescriptions of the working plan.					Operations carried out.						Details of yield.					Remarks.
Year.	Name of felling series.	Coupe number or name of locality.	Area in acres and hectares.	System of felling.	Year.	Name of felling series.	Coupe number or name of locality.	Surveyed area of coupe.	Area of coupe actually worked.	Nature of fellings.	Description of out turn.	Average outturn per acre.	Total outturn of coupe.	Revenue realised per acre or hectare.	Gross revenue realised.	Particulars regarding 'reserved' trees retained in the coupe (if any).
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)

CONTROL BOOK FOR THE RESERVE SANDAL WORKING CIRCLE.

Prescriptions of the working plan. — Locality to be exploited.				Record of operations carried out. — Locality exploited.					Fellings made.		Control.		
							Sub-coupe.						
Year.	Number of coupe.	Area in acres.	Nature of fellings.	Year.	Number of coupe.	Area in acre.	Number.	Area in acres.	Nature of fellings.	Total yield (rough cleaned sandal-wood).	Deviations, if any.	Authority and brief reasons for deviations.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)

CONTROL BOOK FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

Prescriptions of the working plan.					Operations carried out.					Details of yield.		
Year.	Name of produce.	Unit of lease.	Period of lease.	Method of working.	Year.	Name of produce.	Unit of lease.	Period of lease.	Method of working.	Yield obtained.	Gross revenue realised.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

CONTROL BOOK FOR THE GRAZING WORKING CIRCLE.

Prescriptions of the working plan.				Operations carried out.								
Year.	Areas opened to grazing.	Name and area of localities closed to grazing.	Details of penning.	Year.	Areas opened to grazing.	Name and area of localities closed to grazing.	Number and description of cattle grazed.	Revenue realised.	Grazing incidence per cow unit.	Name of pen.	Number of cattle licensed to pen.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

RECORD OF WORKS.

Prescriptions of the working plan.				Record of operations carried out.					
Year.	Coupe or compartment number, or name of locality.	Area in acres (hectares).	Works prescribed.	Year.	Coupe or compartment number or name of locality.	Area in acres (hectares).	Works done.	Costs.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)

REGISTER OF DEVIATIONS.

Year.	Working Plan prescriptions.	Nature of deviation.	Reasons for deviation.	Remarks on any possible action to remedy the deviation.	Number and date of order sanctioning the deviation.
(1)	(2)	(3)	(4)	(5)	(6)

Control Journal for the Reserve Sandal Working Circle.

A. *Growing Stock.*

(i) Remarks on the sandal growing stock.

(ii) Comparative remarks on height growth and production of heartwood in the several felling series.

(iii) Notes on the ecology of sandal.

B. *Factors influencing the crop.*

(i) Remarks on incidence of spike, if any.

(ii) Observations on local or individual affinity to spike. Suggestions of possible reasons.

(iii) Influence of spike on distribution of girth classes.

(iv) Incidence of fire in sandal areas from year to year. Observations on the effect of fire on sandal.

(v) Observations on the reactions of variations in climate on the sandal growing stock.

(vi) Observations on the prevalence of theft, and destruction or damage to sandal by man or animals.

(vii) Observations on the effect of insolation on heartwood production.

(viii) Observations on the nature and extent of sandal.

(ix) Incidence of grazing and its effect on the sandal growing stock.

C. *Exploitation.*

(i) Remarks on the suitability or adequacy of the methods of exploitation prescribed.

(ii) Abstract of the number of trees marked in each sub-coupe and the yield realized with remarks on the proportion of sapwood trees.

(iii) Remarks on the fluctuations in yield in each sub-coupe.

(iv) The cost of exploitation including transport charges in each sub-coupe with explanations of variations.

(v) Remarks on labour supply.

(vi) General remarks on the results of inspection of forest depots.

(vii) Full account of deviations made from the working plan with detailed reasons.

D. *Measures of improvement.*

(i) Remarks on the suitability or adequacy of the methods of exploitation prescribed with results.

(ii) Remarks on the results of fire protection operations carried out.

(iii) Suggestions for the improvement of communications and buildings.

E. *Regeneration.*

(i) *Natural regeneration.*—Remarks on the extent of natural regeneration observed in various localities—Comparative comments on the natural regeneration in spiked and unspiked localities, if any. Remarks on the probable causes of the poverty or abundance of natural regeneration.

(ii) *Seeding.*—Observations on whether sandal always seeds twice every year—Comparison of seed crops in the first and second seedings. Time of seeding in each locality.

F. *Market.*

(i) Statement of the price realised for each class of sandalwood.

(ii) Total quantity of sandalwood and gross revenue realised.

(iii) Comments on the market in general and on fluctuations in price.

G. Statistical.

(i) Notes on dryage, loss in conversion, etc.

(ii) Out-turn averages.

CONTROL JOURNAL FOR THE FUEL WORKING CIRCLE.

A. *Growing Stock.*

(i) Notes on growing stock, the relative fuel nature of various species, their distribution in the several felling series, etc.

B. *Factors influencing the crop.*

(i) Notes on various forms of climatic or natural damage to the crop.

(ii) Illicit fellings and other forest offences and suggestions for preventing them.

(iii) Incidence of fire and comments on the necessity for or adequacy of the fire protection measures prescribed.

(iv) Notes on the extent to which climbers check coppice growth and on the need, if any, for tending measures.

C. *Exploitation.*

(i) Notes on the suitability of the present division into felling series with reference to the requirements of local markets.

(ii) Notes on the adequacy of the output of firewood.

(iii) Notes on the suitability of the rotation and the methods of working prescribed.

(iv) Detailed observations on (1) the regrowth of coppice shoots, (2) causes for failure of coppice, (3) influence of season of cutting and of high or low cutting on the regrowth, and (4) relative coppicing power of different species.

(v) Notes on contractors' and labour supply.

(vi) Statements of prices realised per acre in each felling series and comments.

(vii) Comments on why any particular series could not be worked in any year.

(viii) Full account of deviations from the working plan, if any, with detailed justification.

D. *Measures of improvement.*

(i) Remarks on the conduct of the fire protective operations and their results with suggestions as to possible modification in lay- out.

(ii) Remarks on the degree to which the closure to grazing was enforced.

(iii) Suggestions for the improvement of communications and export routes.

E. *Regeneration.*

(i) *Natural regeneration.*—Observations on the extent of natural regeneration of various species.

(ii) *Seeding.*—Observations on the seeding of fuel species, time of seeding, etc.

(iii) *Artificial regeneration.*—Detailed comments on the success or failure of the regeneration measures prescribed with reasons.

(iv) Suggestions for improvement or modification of technique.

(v) Notes on the relative success attained with the various species attempted to be introduced.—Notes on exotics introduced.

(vi) Notes on germinative power and plant per cent of seeds of various species.

(vii) Notes on pre-treatment of seeds.

F. *Markets.*

(i) Notes on the adequacy of the provision made for catering for various local markets.

(ii) Prices of firewood in important markets.

G. *Summary and expenditure.*

A summary of revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

Control Journal for the Irrigated Teak Plantation Working Circle.

A. *Growing stock.*

(i) Notes on the distribution of various species in the annual coupe in the Odanthorai series.

(ii) Notes on the distribution of girth classes in the annual coupe in the Hulikal series.

B. *Factors influencing the crop.*

Notes on—

(i) Climate.

(ii) Animals.

(iii) Insects.

(iv) Fungi.

(v) Fire.

(vi) Weeds such as *Puchedi.*

(vii) Climbers.

(viii) Parasites.

(ix) Man.

C. *Exploitation.*

(i) Notes on the suitability of the present division into felling series and coupes.

(ii) Notes on the suitability of the method of working prescribed.

(iii) Notes on contractors' and labour supply.

(iv) Statement of out-turn of yield obtained in all the felling series, with qualitywise particulars.

(v) Full account of deviations from the working plan, if any, with details of justification.

D. *Regeneration.*

(i) Detailed comments on the success or failure of the artificial regeneration measures prescribed with reasons.

(ii) Suggestions for improvement or modification of the technique.

(iii) Comments on the existing watering technique and regime with suggestions for modification, if any.

(iv) Notes on the relative success attained with each of the secondary species, viz., *Eucalyptus* hybrid, *Eucalyptus rostrata* and *Karumarudu* in areas unsuitable for teak.

(v) Notes on the relative merits of underplanting with *Daincha* or Camphor Tulsi or otherwise—with particulars of expenditure incurred and yield obtained.

(vi) *Nursery practice.*—Observations on the germinative power and pre-treatment of seeds.

(vii) Notes on the weedings and cleanings proposed and suggestions to modify them.

(viii) Notes on the thinnings prescribed and how they work.

(ix) Notes on conversion and sale of thinned produce.

E. *Markets.*

(i) Statement of prices obtained in each of the felling series.

(ii) Prices of poles, small timber and firewood in various markets.

G. *Summary of Revenue and Expenditure.*

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE BAMBOO WORKING CIRCLE.

A. *Growing Stock.*

1. Notes on the relative distribution of bamboo clumps in each of the felling series.

B. *Factors influencing the crop.*

Notes on—

(i) Climate.

(ii) Animals.

(iii) Insects.

(iv) Fungi.

(v) Fire.

(vi) Man.

C. *Exploitation.*

(i) Notes on the suitability of the present division into felling series.

(ii) Notes on the suitability of the method of working prescribed.

(iii) Notes on contractors' and labour supply.

(iv) Statement of the quantity of bamboos removed classwise.

(v) Statement of prices realised from the several felling series and comments.

(vi) Deviations, if any, from working plan prescriptions with detailed justification.

D. *Measures of improvement.*

(i) Remarks on the conduct of fire protection operations and their results, with suggestions as to possible modifications.

(ii) Suggestions for the improvement of communications and export routes.

E. *Flowering.*

Observations on the extent of flowering.—Whether (i) sporadic or (ii) gregarious and (iii) species affected.

F. *Regeneration.*

Observations on the extent of natural regeneration of bamboos flowering.

G. *Markets.*

(i) Notes on the adequacy of provision made for catering to various local markets.

(ii) Prices of different classes of bamboos in various markets.

H. *Summary of Revenue and Expenditure.*

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

A. *Growing stock.*

Notes on the different items of minor forest produce available in the region.

B. *Factors influencing the crop.*

Notes on—

(i) Climate.

(ii) Animals.

(iii) Insects.

(iv) Fungi.

(v) Fire.

(vi) Man.

(vii) Weeds and climbers.

C. *Exploitation.*

(i) Notes on the suitability of the present division into ' units ' of sale.

(ii) Notes on the suitability of methods adopted by contractors in collecting minor forest produce.

(iii) Notes on contractors' and labour supply.

(iv) Statement of prices realized per unit and comments.

(v) Particulars of units worked departmentally with results.

(vi) Notes on the existing quarries, quality of stone removed and revenue realised.

(vii) Full account of deviations from the working plan prescription, if any, with full justification.

D. *Methods of improvement.*

(i) Suggestions to improve the exploitation of minor forest produce hitherto untapped, if any.

(ii) Suggestions for the improvement of methods of collection adopted.

(iii) Relative success or otherwise in the introduction of avenue trees of tamarind along forest roads, with costs.

(iv) Relative success or otherwise in the introduction of *shekoy* on an experimental scale, with cost.

(v) Results of planting palmyras along reserve boundaries with costs.

E. *Markets.*

Prices of minor forest produce in the local markets.

F. *Summary of Revenue and Expenditure.*

A summary of annual revenue and expenditure in such a form as will facilitate comparison with the financial forecast in the working plan.

CONTROL JOURNAL FOR THE GRAZING WORKING CIRCLE.

1. Annual abstract of grazing permits issued by villages.

The following headings are suggested :—

(*a*) Year.

(*b*) Name of village.

(*c*) Number and description of permits issued.

(*d*) Number and description of permits issued in the previous year.

(*e*) Reasons for increase or decrease.

2. Notes on the suitablity or otherwise of the agency of collection employed.

3. Notes on the suitablity or otherwise of the grazing year adopted.

4. Notes on the efficacy of closure of burnt areas (*a*) as a punitive measure, and (*b*) as a silvicultural measure.

5. List of areas closed to grazing annually on account of fire with notes on the result of half-yearly inspection.

6. Notes on the desirablity or otherwise of closure of fuel coups to grazing.

7. Notes on the desirablity or otherwise of permitting penning.

8. Statement of revenue and expenditure as laid down in the Madras Forest Code to facilitate comparison with the financial forecast made in the working plan.

APPENDIX VIII.

LIST OF MAPS APPENDED TO THE PLAN.

A. *Detailed management maps* (4 inches = 1 mile or 1 cm. — 1, 584 kilometers).

1. S.I. sheet No. 10.
2. S.I. sheet No. 11.
3. S.I. sheet No. 12.
4. S.I. sheet No. 13.
5. S.I. sheet No. 55.
6. S.I. sheet No. 56.
7. S.I. sheet No. 59.
8. S.I. sheet No. 60.
9. S.I. sheet No. 61.
10. Velamundy forests.
11. Chennimalai, Vellikaradu, Voipadi and Kengampalayam forests.
12. Arachalur R.F.

B. *Irrigated Teak Plantation Working Circle*. (16 inches 1—mile or 1 cm.—03963 kilometre).

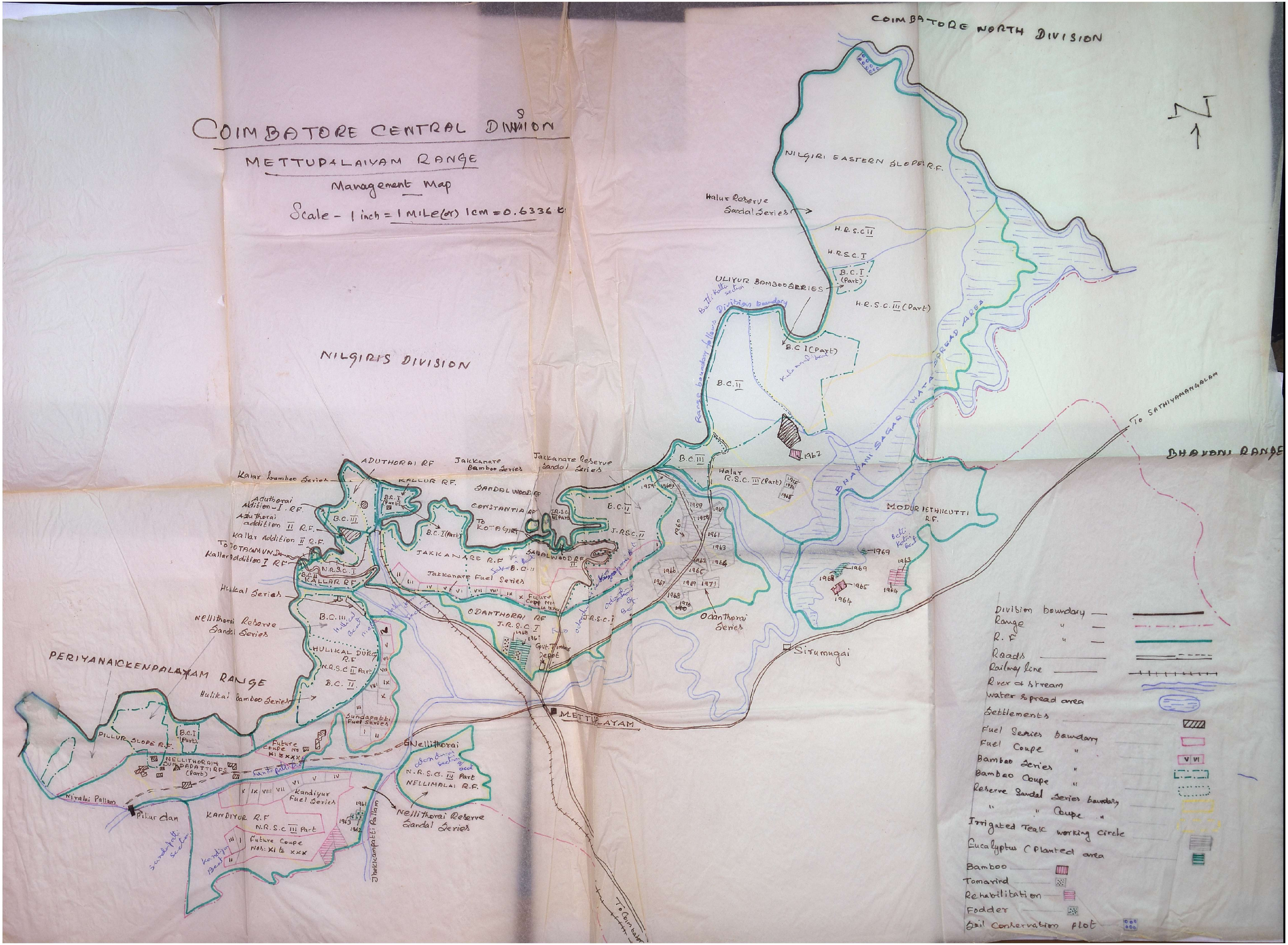
13. Odantherai series.
14. Do.
15. Hulikal series.

C. *Key maps*. (1 inch—1 mile or 1 cm.—6336 kilometres).

16. Key map of Mettupalayam Range.
17. Key map of Bhavani Range.

Divisional map (1 inch—4 miles or 1 cm.—2·5344 kilometres).

18. Key map of Coimbatore Central Forest Division.


COIMBATORE CENTRAL DIVISION
METTUPALAIYAM RANGE
Management Map
Scale - 1 inch = 1 MILE (or) 1cm = 0.6336
COIMBATORE NORTH DIVISION
NILGIRIS DIVISION
BHAVANI RANGE
PERIYANAICKENPALAYAM RANGE
NILGIRI EASTERN SLOPE R.F.
Halur Reserve Sandal Series
ULIYUR BAMBOO SERIES
BHAVANI SAGAR WATER SPREAD AREA
MODUR VETHIKUTTI R.F.
To SATHIYAMANGALAM
ADUTHORAI RF
KALLUR R.F.
Kalar Bamboo Series
Jakkanare Bamboo Series
Jakkanare Reserve Sandal Series
SANDAL WOOD RF
CONSTANTIA RF
To KOTAGIRI
JAKKANARE R.F
Jakkanare Fuel Series
ODANTHORAI RF
Odanthorai Series
Hulikal Series
Nellithorai Reserve Sandal Series
HULIKAL DURG R.F
Hulikal Bamboo Series
PILLUR SLOPE R.F.
NELLITHORAI SUNDAPATTI RF (Part)
Sundapatti Fuel Series
Nellithorai
N.R.S.C. III Part
NELLIMALAI R.F.
Nellithorai Reserve Sandal Series
Kandiyur Fuel Series
KANDIYUR R.F
Future Coupe Nos: XI to XXX
Pillur dam
Miralai Pallam
Thekkampatti Pallam
METTUPALAYAM
Sirumugai
Gvt. Timber Depot
To Coimbatore
Division boundary
Range
R.F
Roads
Railway line
River & stream
Water spread area
Settlements
Fuel Series boundary
Fuel Coupe
Bamboo Series
Bamboo Coupe
Reserve Sandal Series boundary
" " Coupe
Irrigated Teak working circle
Eucalyptus (Planted area
Bamboo
Tamarind
Rehabilitation
Fodder
Soil Conservation plot